



Get the dope on knowledge management. Our supplement follows page 48.

Computerworld QuickStudy debuts! Our new feature offers primers on hot technologies. This week, learn about directories. Page 32

# COMPUTERWORLD

The Newsweekly for Information Technology Leaders  
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January 26, 1998 • Vol. 32 • No. 4 • 120 pages • \$3/Copy \$48/Year

## Too late for Y2K silver bullet

► **Faster route: Shelve packaged apps, rewrite code**

By Julia King  
and Thomas Hoffman

REALITY IS BEARING DOWN hard on companies that had planned to replace rather than fix software applications before 2000.

They are already out of time.

As a result, Plan B is an effect at companies such as \$14 billion AlliedSignal, Inc.

The Morristown, N.J.-based manufacturer this year will redirect the lion's share of its information systems budget to fixing legacy systems while it slows down spending on an on-

going \$50 million-plus SAP AG R/3 project. *Computerworld* has learned.

"It's too late to fix the entire company with SAP," said Robert Scott, vice president of AlliedSignal's SAP Center of Excellence, in Morristown. There simply isn't enough time between now and the end of 1999 to implement the software, much less analyze and possibly revise thousands of processes across the company's automotive, aerospace and materials businesses.

Instead, AlliedSignal will spend millions fixing systems it knows it will scrap once the bulk of its R/3 project is completed sometime after 2002.

"The number of systems we'll Year 2000, page 104

### TRACK THE SHOW TRENDS

What will be your primary E-mail/gateway application one year from now?

Base: 101 Lotus Notes users



For the latest on Lotusphere '98, see feature and page 16. Our coverage tracks slow user response to Lotus' venture into Java and open standards.

Is your company planning a network upgrade this year?

Base: 105 networking professionals



What's coming up at CamNet '98? See pages 12 and 14. Find out what's really happening with VPNs and DSL. Plus, get the latest on active monitoring tools and more survey data.

## Java, NCs headline Lotusphere

By April Jacobs

USERS WHO WANT to trim costs will get their wish at this week's Lotusphere '98, which will spotlight a big Network Station customer win for IBM and a delivery schedule for ESuite, Lotus Development Corp.'s Java-based application suite.

Observers said ready-to-go

Java-enabled productivity applications, and a strong showing by pilot users of network computers, are expected to assure users that lower prices and support costs don't have to add up to limited functionality and slower performance, analysts said.

To date, those issues have Lotusphere, page 16

## Sanford offers up customer savvy as IBM sales chief

By Jaikumar Vijayan

LINDA SANFORD'S IDEA of a great vacation is the beach, and lots of sun.

Not that she will have an awful lot of time for those sorts of luxuries in the near future.

Newly appointed to IBM's top sales job, Sanford will have her hands full managing a 17,000-person organization that last year generated a staggering 70% of IBM's \$80 billion in revenue.

Early expectations are that Sanford—who is credited with turning around IBM's once-moribund mainframe business—will help foster a more customer-driven, relationship-oriented sales strategy.

Joseph W. Farrell, chief information officer, page 104

## Big iron gets a case of WEB FEVER

By Jaikumar Vijayan and Tim Ouellette

ON THE SURFACE, SpeedServe, Inc.'s Web site looks like every other electronic-commerce site around the world. But under the covers, it is hosted on—gasp!—a mainframe.

World Wide Web sites usually are powered by much smaller Unix or Windows NT servers. But as electronic commerce matures, some companies have found that hosting a Web site on a mainframe provides more horsepower for high-volume transactions, greater reliability and faster access to databases.

SpeedServe, an online bookseller similar to Amazon.com, Inc., never had a mainframe before. But the company brought one in last summer to process the

Big iron, page 28

**350,000 vacant IT jobs! A 40% drop in IT grads! 1.3 million more IT workers needed in the next decade! Where do they get these numbers? In a two-part series, *Computerworld* looks at the alarming predictions about the IT workforce and explains what the numbers really mean.**

IT Careers, page 88

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## UP FRONT

## Info overload

**D**o you ever feel like your head is going to explode? Readers tell us they feel that way all the time. The faddish nature of new technology (remember Internet "push"?) and the relentless pace of product development make it just about impossible to keep current with trends. In fact, our research for years has put "keeping up with technology" at the top of the list of readers' job challenges. We can help.

On page 32, we proudly introduce Computerworld QuickStudy, a weekly one-page department for people who want, in plainspeak, an overview of terms, trends and opinions about issues that are hot—or about to be hot—in the IT community. You can read it in five minutes. I promise.

In coming weeks, Computerworld QuickStudy will look at virtual private networks, object databases, supply-chain management and public-key encryption. All are topics that inspire frenetic activity and debate. All will be covered with an eye toward giving you information you can use right away.

### QuickStudy will deliver hot IT issues in plainspeak.

On the Web, you can find links to Computerworld articles, book summaries, white papers, conference descriptions and other related materials. Start at [www.computerworld.com](http://www.computerworld.com) and choose the Resources tab.

Check out Computerworld QuickStudy. And send ideas for topics and improvements to our mailbox, below.

\*\*\*\*\*

Many Cobol programmers wrote to ask where they could get the \$1,500-per-day salaries for year 2000 work that I mentioned in my column last week. Sorry, my mistake. The \$1,500 figure is for year 2000 consultants and was estimated by San Diego-based Technology Management Reports ("The pressure builds," CW, Jan. 5). The good news for consultants: The firm expects the figure to rise to \$2,500 per day by next year.

Paul Giffin, Editor  
Internet: paul\_giffin@cw.com

### THE FIFTH WAVE BY RICH TENNANT



Email Rich Tennant at [rt1@earthlink.net](mailto:rt1@earthlink.net)

# Online security leak

► AOL privacy violation is wake-up call for IS; sites urged to tighten, enforce security measures

By Kim Cusano

AMERICA ONLINE, INC.'s admission that it violated its own privacy policy by giving the U.S. Navy personal information about a subscriber may have a chilling effect on users already concerned about privacy on the Web.

Observers said the case, which has legal experts and electronic privacy gurus buzzing, could either make corporations more wary of using the World Wide Web for business or push them to tighten their existing security policies.

It also could cause potential online customers to think twice before posting private information on a Web site without knowing how far the government or other interested parties can go to get it.

"The [questions] [this case] raises are. What are the rules going to be governing governmental access to online information?"

with that yet."

The lesson for information systems departments is to keep sensitive customer or client information off the Web or behind

"You should not be disclosing information without clear legal authority."  
— Marc Rotenberg,  
Online privacy expert

a secure firewall until more universal security, including better encryption methods, is available, said Mary J. Culnan, a consumer privacy expert at Georgetown School of Business, in Washington.

"You need to treat people's information as carefully as you treat people's money," she said. "Privacy needs to be institutionalized."

Is the America Online case,

victed Oklahoma City bomber. McVeigh's lawyers, who are fighting to prevent his discharge, said both federal law and America Online policy prohibit disclosure of a subscriber's personal information to law enforcement authorities without a court order — which the naval

investigator didn't have.

In a statement, the Navy contended that there was no intentional violation of any federal law and maintained that federal officials aren't required to identify themselves when seeking information for an investigation.

### BAD POSSIBILITIES

"The implication [of the Navy policy] is chilling for all users of the Internet," said Christopher Wolf, McVeigh's lawyer. "Imagine if it was the IRS or the FBI or another government agency, and they were 'free to snoop and get information protected by federal law.'"

"The point with the McVeigh case is you should not be disclosing information without clear legal authority," said Marc Rotenberg, director of the Electronic Privacy Information Center, a Washington-based civil liberties group.

Esther Roditis, a computer law specialist and publisher of the New York-based newsletter "Computer Law and Tax Report," said the question that should be asked is whether "it is reasonable for a person to take what they consider private data and put it on the Internet." □

ation and what steps are online providers going to take to protect subscriber privacy?" said David Sobel, legal counsel at the Electronic Privacy Information Center, in Washington.

### HIGH RISKS

To protect privacy, analysts said, companies — from health care networks that want to send patient billing information to Medicaid offices over the Web to insurance companies that report customers' HIV status on forms stored on an intranet — need to be more careful about internal security and enforcing strict privacy policies.

Some organizations, such as Staten Island University Hospital, in New York, aren't ready to take a full online risk.

"Vendors talk about Web-enabled databases that will allow physicians to dial in and get [patient] information through an intranet," said hospital Chief Information Officer Patrick Carey. "We're not comfortable

Staten Island University Hospital CIO Patrick Carey says the hospital isn't ready to confront a full online security risk.

one of the online provider's representatives, while on the phone with a Navy investigator who didn't identify himself, confirmed that Senior Chief Petty Officer Timothy R. McVeigh was the author of an AOL page that used the word "gay" to describe his marital status. McVeigh, who faces discharge under the military's "don't ask, don't tell" policy on homosexuality, isn't related to the con-



# Sybase layoffs loom in wake of \$60M sales snafu in Japan

By Craig Stedman

SYBASE, INC. users braced themselves for more disruption and doubts about the future after the database vendor disclosed it was bitten by its own strain of the Asian flu.

Executives at Sybase last week warned that their discovery of about \$60 million worth of improperly booked revenue in Japan will almost certainly force them to lay off employees. And the cuts may not be limited to Japan and other financially ailing Asian countries.

"[Sybase was] just taking a peek out of the hole they were in, and all of a sudden there's a rock landing on them."

— Merv Adrian, Giga Information Group

"We will have to look at our entire expense level now," said Sybase CEO Mitchell Kertzman during a teleconference. "We're going to do whatever we have to do to be a profitable company."

Kertzman deserves credit for

## THE DAMAGE DONE

Fallout from Sybase's Japanese problems includes:

- ▶ A fourth-quarter loss "substantially" larger than expected
- ▶ Restatement of financial results for the rest of 1997
- ▶ Employee layoffs, potentially extending beyond Asia
- ▶ The firing or resignations of five top Japanese managers
- ▶ A switch to cash-only sales in Japan.

"not trying to sugarcoat it," said Brent Sanderson, information technology manager at the state of Utah's finance division in Salt Lake City. "To me, that shows some corporate courage."

But Sanderson, who runs several applications on Sybase databases, said he will have to wait and see what kind of layoffs Kertzman has in mind.

And the financial fallout from the Japanese debacle "is just more ammunition for anybody who kind of had a negative view" of Sybase, he said.

The faulty Japanese bookings, which external auditors uncovered early last week, will result in a big fourth-quarter loss and a restatement of earlier results (see chart). The release of the fourth-quarter numbers was postponed until this week to give Sybase time to determine the full extent of the revenue hit.

Merv Adrian, a database ana-

lyst at Giga Information Group, in Santa Clara, Calif., said the Japanese brouhaha will make it harder for Sybase to convince new buyers that it is a safe bet for big database investments.

## NO TURNAROUND

The snafu also squashes any thoughts that Sybase was close to snapping out of a year-long software sales decline.

"It's extremely disappointing," agreed Jim Dileo, senior vice president of worldwide IT at The MacManus Group, a New York-based advertising and public relations firm that is a big Sybase customer.

Dileo said he remains confident about Sybase's software and its management. "But if you're sitting there as a prospect and you've got a couple of choices, this kind of uncertainty isn't healthy for Sybase," he said.

Kertzman said managers in

## Asian woes factor in to financials

Weakeness in the Asian markets was the dominant theme as many of the major computer companies announced quarterly results last week. Following is a quick rundown:

- IBM — Profits rose only 3.4%, and the company warned that earnings in the current quarter will fall below the prior year because of the strong dollar and weak Asian markets.
- Microsoft Corp. — Profits were up 53%, and revenue rose 43%. But the company warned that the Asian crisis could depress revenue for the rest of the year.
- Compaq Computer Corp. — Profits were up 37%, and revenue was up 23%. But sales were down 15% in Japan and 17% in the rest of Asia.
- Lucent Technologies — First-quarter profits shot up by 17%, and the company predicted that the strong showing will continue.
- Seagate Technology, Inc. — Second-quarter losses totaled \$18.5 million, and revenue fell 30% from a year ago. The company is suffering the effects of a worldwide disk drive glut.
- Ascend Communications, Inc. — Net income was \$3.6 million, down from \$64.5 million a year earlier. Asian demand was weak.
- Symantec Corp. — Revenue was up 20%, and net income was up 58% on strong sales of antivirus and other security software.
- Bay Networks, Inc. — Profits were \$47.5 million, compared with a loss of \$72.9 million a year earlier. Revenue rose 35%.
- Computer Associates International, Inc. — Net income increased 19%, revenue rose 18%. Client/server sales led the way.
- NCR Corp. — Revenue slipped by 2.4%, but the company posted a \$36 million profit, up from \$7 million in the prior year.

Japan secretly tacked on so-called "side letters" to purchase contracts to give buyers the right to return software and ask for their money back — a clause

that goes against Sybase's sales policy. Some of the deals may eventually become void again. "But there's no way of saying that right now," he added. □

# Corel posts \$232M loss

▶ CEO says he expects turnaround this year

By Gordon Mak Ung

CANADIAN SOFTWARE maker Corel Corp. took a smaller hit in the fourth quarter than expected but still announced a disappointing loss of \$23.8 million for the year.

The company posted a net loss of \$67 million for its fourth quarter, which is better than the \$95 million it expected to lose.

The maker of WordPerfect Suite and CorelDraw attributed the difference to an accounting change in how it would write off the acquisition of Java technology from other companies.

Revenue for the fourth quarter came in at \$43.6 million and \$260.6 million for the year.

Just two years ago, Corel posted \$145.4 million in net revenue

for the fourth quarter and \$334.4 million for the year.

"We've had a tough year... on the other hand, that happens every 10 or 12 years in this business," said Michael Cowpland, CEO and president of the Ottawa company. Cowpland added that he has no plans to leave.

Cowpland said an increase in cash reserves — up \$8 million to \$30.6 million — and the introduction of Java and network computer products this year are positive signs. "Although the success is not yet evident, we think 1998 will change that perception entirely," he said.

Corel's office suite revenue was a dismal \$4.7 million in the fourth quarter, but officials said that was influenced by unusually high product returns. □

## CRASHING THE GLASS CEILING



It takes hard work and smarts to get to the top in IT. Four women tell Ms. MIS columnist Laura DeDe what it takes to rise to leadership. Managing, page 73

Price action in the Internet stock market is as turbulent as the service providers, at least when it comes to equal business from providers, users told Computerworld. See also: page 79

Reports from AIST and ISG Tech. The Enterprise Edition, page 40

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## Netscape sows innovation with source code giveaway

► Bold move aimed at gaining 'net mind share'

By Carol Shaw

NETSCAPE COMMUNICATIONS Corp.'s decision last week to give away its Internet browser wasn't much of a surprise. Its revenue and market share have been declining, and Microsoft Corp.'s competing product is free.

But the Mountain View, Calif., software maker caught many observers off guard with its move to give away the source

"This will hurt Microsoft.

... Netscape essentially has come home. They've come back to their roots."

— Michael Gouldie,  
Patricia Seybold Group

code of its Communicator groupware/browsers. The idea is to spur innovation in the Internet developer community.

"I think it's brilliant," said Neil Fox, manager of advanced development and applied technologies at TRW, Inc., in Cleveland. "I'm looking forward to seeing all the creative additions and modifications people will make to the Web client."

Officials at Microsoft, which makes available only its application programming interfaces, dismissed the move. "Frankly, we don't think that strategy gives you the consistency that consumers want in the market place," said Vice President Sam Jadhav.

But others sounded intrigued by the concept of a commercial software vendor freely licensing its software code.

"This will hurt Microsoft," predicted Michael Gouldie, an analyst at Patricia Seybold Group, in Boston. "I think the inhabitants of the global Internet culture are going to start paying less attention to Microsoft and more attention to Netscape. Netscape essentially has come home. They've come back to their roots."

Given Netscape's slumping finances, ongoing layoffs and very wealthy arch competitor, the attempt to spark product in-

novation without having to hire new employees makes sense, observers said.

But if Netscape officials believe that the company's move will help reduce its internal spending on the client, they are "sadly mistaken," said Tim Sloane, an analyst at Aberdeen Group, Inc., in Boston.

### CULTIVATING DEVELOPERS

"It takes no effort at all to throw the seed in the ground. It takes more effort to see it through the season," Sloane said. "In essence, they've added a few thousand developers to the ranks, but they still need to coordinate and support those developers."

The floodgates to innovation could crack open, but the benefits may not be so obvious for corporate information systems staffers, some of whom worry that workers will add new products or features without permission.

"The corporate side of the isn't terribly excited," Fox said. "When you have everyone out there with different features in their Web client, how do you support that? You can't produce."

### NETSCAPE MOVES

► Will make client source code available with the Communicator 5.0 developer release in the first quarter.

► Reduced price of Communicator Professional Edition to \$29. Pro Edition now has calendar, mail, and news access and centralized management features.

Netscape's once-dominant World Wide Web browser market share has slipped to between 50% and 65%, depending on the survey.

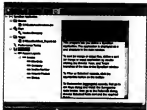
But the tide could turn if Netscape can land some bundling deals with PC makers. Netscape Chief Technology Officer Eric Hahn said an announcement can be expected in the coming weeks with one or more PC makers.

A year ago, client sales represented 45% of Netscape's revenue. Now with the figure at 15%, Netscape officials said they can opt to give away the product. □



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## FRANKLY SPEAKING

## Wanted: true believers

FRANK HAYES

**A**T FIRST GLANCE, you wouldn't want the operatio Timothy Sullivan faces.

Sullivan is CIO at Kaiser Permanente, and he just launched a billion-dollar project to link the HMO's hospitals, clinics and offices — all 8.9 million members — in a nationwide clinical information network.

To start rolling out the system on schedule later this year, Sullivan will have to hire more than 100 technical people and hang on to, or replace, hundreds of other Kaiser information systems people working on the project. That's right: The project could require hundreds of new hires in the middle of the worst information technology labor shortage in history, at a time when the year 2000 crunch is absorbing even more techies. And Kaiser Permanente is across San Francisco Bay from Silicon Valley, which

soaks up any available IT talent like a surgical sponge. So how will Sullivan get all those technical people — by wheeling them in on gurneys stuffed with money? Not exactly.

"The financial picture needs to be adequate and fat," he told me. "But a bigger area is the organization engaging the individual in activities



## It's time your IS people started to believe in your company's mission

that are worthwhile. The organization creates spirit and camaraderie and fulfillment in people's lives."

Hub? "Spirit and camaraderie and fulfillment." Is this guy serious?

Well, he has half the IT turnover rate

of most big companies — it's 15% at Kaiser, compared with a Fortune-500 average of 25% to 35%, according to a survey by Silicon Valley recruiting company Advanced Technology Staffing in Redwood City, Calif.

And a big part of that seems to be that Kaiser IS staffers believe they help keep people healthy. Kaiser has a mission — and Sullivan's IS people believe in it. Maybe it's time your IS people started to believe in your company's mission, too.

Face it, you can't afford to treat IS professionals as interchangeable hired guns who just build systems and run networks. You're paying top dollar and still struggling to hire all the people you need. You've got to offer something more — a reason to care about your organization that goes beyond money — or the cost will kill you.

Caring about your company's mission is crucial to creating IS loyalty that goes beyond a paycheck — and it's also the first step in putting technology at the service of that business mission. When IS people know and care about what their company does, they've got a focus — and a reason to deliver.

So how do you get IS connected with that mission? You can't do it with pep talks. And you can't do it from within the glass cage of your IS shop. Working heads-down is the best way to keep IS people disconnected from the rest of the company.

Maybe it's as simple as a field trip to let them talk with other employees. March your IS people up to meet with the folks who design your products. Or down to the factory floor to see the products being physically produced. Or out to see real customers using them. That's what your business is about — not code and packets, but customers and products.

Think a field trip sounds too hokey? Come up with other ways of getting IS excited about your company's mission. And get fired up about it yourself. If you don't, your people won't either.

Think you can't afford the time because your projects are already behind schedule? Don't kid yourself, you can't afford not to get IS connected to your business mission. If you don't, your IS shop — and maybe your business — could be on life-support for a long time to come. ☐

Hayes is Computerworld's West Coast bureau chief. His Internet address is [frank\\_hayes@cw.com](mailto:frank_hayes@cw.com).

## SHORTS

### Feds to post domain name policy

White House adviser Irgi Magaziner said a policy draft on the government's stance on privatization of Internet domain name registration will be posted at [www.ecommnet.gov](http://www.ecommnet.gov) by the end of the week. The draft will be open for comment for 30 days and could take months more to implement, Magaziner told reporters in Newton, Mass., last week. Network Solution, Inc.'s current registration of .com and other names expires in March, but Magaziner said there is a "ramping-down period" for another six months, which will give the government time to help private groups create an open, shared registration system.



### Wall St. pushes for Y2K holiday

The board of directors of the Securities Industry Association (SIA) has endorsed a proposal to declare Dec. 31, 1999, a trading holiday in order to complete year-end processing before 3000 arrives [CW, Jan. 19]. New York-based SIA, which represents nearly 800 investment banks, broker-dealers and mutual fund companies, must also win endorsements from the New York Stock Exchange and other market and federal regulators. The SIA hopes to win approval by March 31 to plan for the day off.

### SAP to launch consulting service

SAP AG is getting ready to launch an outsourcing business, Computerworld has learned. SAP officials said the plan is to begin outsourcing business processes for companies in four areas: human resources and payroll,

procurement, financial services and order entry. The idea is to partner with financial institutions, established outsourcing companies such as Electronic Data Systems Corp., and with smaller boutique SAP implementation partners. SAP rival PeopleSoft, Inc. earlier this month announced it was launching a similar service.

### Belluzzo bolts HP to head SGI

Troubled workstation maker Silicon Graphics, Inc. (SGI) tapped Richard E. Belluzzo as its chairman and CEO, succeeding Edward E. McCracken. Belluzzo, 44, leaves his job as executive vice president and computer systems general manager at Hewlett-Packard Co., where he was seen as a potential successor to CEO Lewis Platt. Mountain View, Calif.-based SGI last week posted a \$31 million loss for its quarter ended in December and is involved in a companywide restructuring.

### Zander scales Sun ladder

Edward J. Zander, 51, has been promoted to the new position of chief operating officer at Sun Microsystems, Inc. following published reports suggesting he was being courted by Apple Computer, Inc. to fill its CEO position. Zander, who ran the company's SunSoft software business, most recently was president of Sun's hardware business. In his new role, Zander will run Sun's daily operations and participate in strategic planning at the Palo Alto, Calif.-based company.

### AS/400 gets native Domino

IBM is boosting capabilities with native support of Lotus Development Corp.'s Domino server. The long-expected move enhances the AS/400's ability to run groupware, a World Wide Web server and electronic

mail applications. AS/400 users have been able to run Domino on their systems for some time now, but only on a separate PC card. Native Domino support also means users get real-time access to the AS/400's DB2/400 database. The AS/400 Domino version costs \$1,495 for a one-processor version.

### Intel: Software speeds access

Intel Corp. this week will unveil software for Internet service providers that it claims will speed up Web surfing. Officials for the chip maker said they expect the service providers will sell the software to their customers for a fee. Intel said two Internet service providers, Erols Internet, Inc., in Springfield, Va., and Netcom On-Line Communication Systems, Inc., in San Jose, Calif., have agreed to offer the software, along with GlobalCenter, Inc., in Sunnyvale, Calif.

### Microsoft tool answers critics

Microsoft Corp. said its improved Visual InterDev Web application development product addresses users' criticisms. Among the new features to be demonstrated at WebTechEd in San Diego this week is the ability to complete visual page design and debugging without losing source code. A beta for Visual InterDev will be available in the second quarter. Pricing hasn't been set.

**SHORT TAKES** Paul Hoadman is leaving his post as chief information officer at AlliedSignal, Inc.'s Aerospace division, in Torrance, Calif., to become vice president of information systems at The Home Depot, Inc., in Atlanta... On Monday, Gateway 2000, Inc. will announce across-the-board price cuts of up to 18% on all its PC models as well as a new, innovative corporate PC. The 8-1000 corporate model will cost just under \$1,000.



# "Psst ... Wanna Buy Some Time?"

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# Microsoft compromise 'hardly surprising'

By Carol Shaw

GIVEN ITS RECENT attempts to soften its image, Microsoft Corp.'s decision last week to offer two new options to comply with a federal judge's order — at least on a temporary basis — was

hardly a surprise.

"Given the 'kinder, gentler, let's look like we're cooperating' Microsoft of the last month, it was inevitable. Now they can say, 'We're pretending to respect the government,'" said Stan Lepeak, an analyst at Meta Group, Inc., a consultancy

in Stamford, Conn.

Nor is there much expectation among those watching the case that Microsoft's temporary concession will have a significant impact on the world at large. Microsoft will offer a version of Windows 95 that either has the Internet Explorer icon

hidden or various browser files removed using the Add/Remove utility.

"I don't think there will be a ripple," predicted Tim Sloane, an analyst at Aberdeen Group, Inc., in Boston.

Although a Netscape Communications Corp. executive claimed that his company will announce browser deals with one or more PC makers, analysts said they expect few PC makers to stop bundling Internet Explorer with the hardware they ship.

"From a philosophical point of view, it might be a win for Netscape. But practically speaking, it's no harm for Microsoft," Lepeak said.

The initial battle over, Redmond-Wash.-based Microsoft will concentrate its efforts on the appellate front, where it hopes to successfully argue that a U.S. District Court judge erred on several counts when he ordered the company to stop licensing its Windows operating system on the condition that "the licensee also license and preinstall" its Internet browser. A hearing is set for April 21.

Meanwhile, Microsoft's compliance may help to repair the harsh image created when it chose, pending appeal, to comply with the judge's order by offering a 1 1/2-year-old version of Windows or a version that wouldn't work with the full complement of browser files removed.

"They were being impossible," said Neil Fox, manager of advanced development and applied technologies at TRW, Inc., in Cleveland. "I think that they made a mistake. . . And they're finally realizing that was a bad tack to take."

"I think Microsoft needed to find a compromise," said Jay Vander Wall, a technical architect at The Dow Chemical Co., in Midland, Mich. "I'm glad to see they're working it out." □

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## FAQs: Icon update

**Q: What happened last week?**

**A:** Pending its appeal, Microsoft agreed to comply with a federal court's preliminary injunction by giving PC makers the option to license its Windows 95 operating system with the Internet Explorer icon removed from the desktop.

**Q: Is the case over?**

**A:** No. A hearing on Microsoft's appeal is pending, and the company's petition challenging the District Court's referral of the case to a special master also hasn't been resolved.

**Q: What are the possible outcomes?**

**A:** If Microsoft wins the appeal, the preliminary injunction could be terminated. If Microsoft loses, the preliminary injunction could be replaced by a permanent injunction after further proceedings before the special master and the District Court.

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# Virtual nets? Proceed with caution

► Early users cite performance, support issues

By Bob Wallace

COMPANIES LOOKING TO implement virtual private networks (VPN) may run up against performance problems and equipment and software limitations, early users warn.

VPNs are sets of secure links through the Internet that carry encrypted corporate data. The hot new technology will take the stage at ComNet '98 this week in Washington.

VPNs are capturing the attention of cost-conscious information systems managers because they can be much cheaper than private networks. And they can be run by Internet service providers, which would free up staff resources that are already in short supply.

But companies that implement VPNs have to sacrifice the quick and predictable response times they get with private networks.

"The real risk with VPNs is the Internet and how congested it already is," said Mike Gentry, IS director at Prida Gentry, a startup physician practice management company in Atlanta. "If you're going to transmit data between 9 a.m. and 6 p.m., when everybody in the world is on the net,

you'll find the throughput isn't that good, and there are lots of delays."

But for Gentry, the performance is tolerable. "The cost savings far outweigh the risks of using the Internet," he said. The firm's VPN is 80% cheaper than a remote-access network to support physicians' offices and mobile workers, he added.

Steve Miley said he would like his VPN to be faster. The performance of the VPN "is slow, but workable for interactive [Notes] database access," said Miley, MIS director at Deckers Outdoor Corp., a footwear and apparel maker in Glenside, Calif.

## SUPPORT AN ISSUE

Performance isn't the only thing users need to beware of, said Bill Clapes. Companies that want to use VPNs for remote access applications will find that hardware/software packages don't always support enough far-flung users and can lack roaming features.

"One catch is the number of remote users that some [systems] can handle authentication for varies," said Clapes, director of franchise systems and multi-media technology at AFC Enterprises, Inc., in Atlanta. AFC owns Popeye's Chicken and Bv

## GOING VIRTUAL

Are you planning to implement a VPN this year?



Source: 1998 Networking professionals  
Survey: Computerworld Information Management Group, Framingham, Mass.

cuts, Church's Chicken and Chesapeake Bagel Bakery.

"If you go with a system and exceed its limit, you'll need to buy additional authentication software for about \$1,500 and a dedicated NT server to run it on," Clapes said.

A low-end Windows NT server can cost \$4,000, he added. "It's a fairly major [additional] investment in product and support," Clapes said.

Another problem is that not all authentication servers can recognize changing IP addresses. Gentry said, Internet providers give mobile users random IP addresses each time they dial in to the server. Failure to accept these addresses can restrict support for roaming workers.

Clapes said companies should choose remote access client software that is simple to configure. "If you choose one that's too difficult, your end users won't use it," he said. One suggestion is to configure the software at headquarters and download it to remote sites, he said. □



Proxy servers can help to save WAN bandwidth.

Page 47

# Digital Subscriber Line standard in the works

By Matt Humble

AFTER YEARS OF crawling, Digital Subscriber Line (DSL) technology may be finding its legs.

Several well-known companies recently announced DSL modems and other products to enable high-speed Internet access for telecommuters and other home-based PC users.

And this week at ComNet '98 in Washington, Intel Corp., Compaq Computer Corp., Microware Corp. and several telecommunications companies will announce the formation of a consortium to set a DSL standard, an Intel spokesman said.

## GREAT POTENTIAL

The news excited analysts and users. "From an internal business applications perspective, [widespread and affordable DSL] would basically open up doors to a lot of applications we haven't been able to address," said Peter C. Gunn, a telecommunications manager at United Parcel Service of America, Inc. in Mahwah, N.J. "DSL offers a lot of possibilities, especially with higher throughput, such as video applications and multimedia."

The consortium would work with Aware, Inc., in Bedford, Mass., to create a standard for Asymmetric DSL operating at download speeds of probably up to 1.5M bit/sec. — or 10 times faster than the fastest telephone modem.

There are several varieties of DSL, but all can use copper telephone lines to send digital information at fast speeds without the need for repeater devices.

Analysts said because there

are dozens of DSL equipment makers and many large phone companies, standardization is needed. DSL could be an important market for large companies that provide remote Internet access for branch offices and telecommuters, said Berge Ayvazian, an analyst at The Yankee Group in Boston.

So far, cable TV companies have been more aggressive in providing fast Internet access, but it will be easier for companies to consider DSL to connect

## RELATED LINKS

For these and other related links, go to:  
[www.computerworld.com/home/feature/98/01/98DSLlinks](http://www.computerworld.com/home/feature/98/01/98DSLlinks)

► Asymmetric Digital Subscriber Lines (ADSL)  
[www.usdslproject.com/](http://www.usdslproject.com/)  
[agcnetwip.finetel.net](http://agcnetwip.finetel.net/)

► The Digital Subscriber Line Technologies — ADSL, SDSL, HDSL, VDSL  
[www.telabs.com/feature/abstract.html](http://www.telabs.com/feature/abstract.html)

to business networks because of the similarity between DSL and conventional telephone networks, Ayvazian said.

The following companies also have plans to advance DSL:

► **Lumit Technologies**, in Murray Hill, N.J., last week announced a DSL chip set called *WideWire* to install in PCs to allow a simultaneous Internet download and a telephone conversation over the same wire.  
► **Texas Instruments**, Inc., in Dallas, this week plans to announce its own ADSL chip in Santa Fe, N.M. □

## The pros and cons of virtual private networks:

### PROS

- 1 Less expensive than private networks
- 1 Outsourcing cuts staff costs
- 1 Doesn't require expensive equipment

### CONS

- 1 Internet performance varies widely
- 1 Some equipment limits the number of users
- 1 Not all packages support roaming features

# New LAN switches add speed, save users time

By Bob Wallace  
and Matt Humble

LAN switching will take the spotlight at ComNet '98 this week in Washington.

A raft of vendors will showcase flexible and low-cost systems at the wide-area network-oriented conference.

The show opens tomorrow with a keynote address from

3Com Corp. CEO Eric Benhamou, who is scheduled to discuss the role that switching will play in enterprise networks.

On the LAN front, these announcements are expected.

► **Achron Networks**, Inc., in San Jose, Calif., will unveil ACE-director 1, a LAN switch designed to boost end-user response times by balancing traffic among servers in a data

center. The system also can save time by redirecting users' requests for access to Internet sites to local World Wide Web caches. Proxy servers also can perform caching. ACE-director 1 has eight ports that can run at 10M or 100M bit/sec. The product will ship next month and costs \$7,995.

► **Foundry Networks**, Inc., in Sunnyvale, Calif., will display

two versatile high-speed switches that can support 10/100M bit/sec. ports. Gigaset Ethernet ports or a mix. The Bigiron 4000 can process 50 million packets/sec. and can support 32 IG bit/sec. ports.

► **Bay Networks**, Inc., in Santa Clara, Calif., will display the BayStack 350T-HD switch, which has 24 ports that can operate at 10M or 100M bit/sec.

The switch costs \$449 per port — less than similar switches from Cisco Systems, Inc. and 3Com. It will ship next month.

And on the WAN front, MCI Communications Corp., in Washington, plans to announce a Web-based customer network management reporting service for broadband services.

MCI also will unveil Web-based software that will allow business users to have voice conversations over a single copper line connected to the Internet. □



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# Users press AT&T for one bill

► CW survey respondents say it's their No. 1 gripe

By Matt Hamblen

AT&T CORP. needs to improve the way it bills companies for long-distance and other services, according to a Computerworld poll of 104 AT&T business customers.

"Their billing process is just awful," said David Brown, director of information technology at McLaren/Hart Engineering Group, in Rancho Cordova, Calif.

Users said AT&T, in Banking Ridge, N.J., has problems aggregating all of a customer's services into one bill. And survey respondents said they want more details in that single bill so they can do internal accounting and bill their units and branch offices for voice and data usage.

## BEING BIG PAYS

However, AT&T and other major carriers have created new billing services for their larger customers in recent years to address those concerns (see chart below).

AT&T provides OneNet to global customers for integrated billing and last week announced that even more services, such as data services and teleconferencing, can be added to a bill.

An AT&T spokesman said he didn't know whether survey respondents who complained about billing were too small to qualify for OneNet or similar services.

But several of those surveyed said they must be too small to get AT&T's attention, even though they had complex orga-

nizations with dozens of offices nationwide.

Schmitz, STS Industries, left AT&T for WorldCom, Inc., in Jackson, Miss., last year after months of trying to get AT&T to add usage information to its bill so the company could charge each of its 50 U.S. locations.

The Portland, Ore.-based company got a better per-minute long-distance rate from WorldCom and a billing format that "does what we want," said controller James Gruchshank.

"I'd like to integrate my three bills from AT&T [for long-distance, electronic-mail and data services] to reduce headaches and get discounts, but I can't," said Rick James, MIS director at L & L Nursery Supply, in Chino, Calif. L & L Nursery has three West Coast locations. James said his company apparently doesn't spend enough with AT&T to qualify for bundled services such as OneNet.

But Franklin Resources, Inc., in San Mateo, Calif., has used OneNet since October, and company officials said it helps streamline auditing of the company's 20 worldwide locations, which have 6,000 users. "Having voice and data services combined in one bill [also] gives us significant leverage in contract negotiations," resulting in much lower costs, said Bach Nguyen, director of global networks at Franklin Resources.

In the survey, billing got the lowest marks from users when compared with other areas of contact, such as service, sales or

contract negotiation.

That contrasted with the generally positive attitudes users had toward AT&T. For example, 46% of AT&T users said they felt "very confident" about AT&T's ability to deliver innovative long-distance products or services. □

◻ AT&T, MCI add controversial fees to comply with federal law. Page 49

## AT&T jobs on the line

AT&T is expected today to announce major new directions in a meeting with financial analysts in New York, including the possibility of cutting up to 20,000 jobs.

AT&T officials wouldn't comment on reports last week that Chairman C. Michael Armstrong received the board's approval to cut up to 15% of the company's 130,000-person workforce.

Some business customers said they were worried that the cuts could hurt AT&T's service.

"Uncertainty about what job cuts at AT&T would mean to service is a factor to us," said John Mickelson, a member of the telecommunications staff at Madison Gas & Electric Corp., in Madison, Wis.

Gary King, 51 manager at Greater Richmond Transit Co., in Richmond, Va., said AT&T has taken longer to respond to outages in the past two years. He also said the newer technicians don't seem as well-trained.

If Armstrong cuts 15%, "that's pretty significant, and I'd worry about the workload spread over the remaining workers, so it's a concern for us," King said.

But analyst Randy Carlson at The Yankee Group, in Boston, said AT&T's service reputation for large customers is the best in the industry and cutting 20,000 jobs wouldn't hurt such a large company.

He said AT&T may be preparing to slim down as it faces the possibility of losing long-distance market share to Baby Bells that have prevailed in recent court decisions.

—Matt Hamblen

## EARLY WARNING

### Situation

Standard monitoring tools can't reveal problems before they affect performance

### Solution

• A new breed of tools model actual performance history to predict problems

• Other new tools automatically check networks, systems and applications regularly with test loads, independent of user activity

### Drawback

• Requires skilled interpretation (by analysis tool, staff or service)

• Test traffic could affect service to users

# Tools become active service-level monitors

By Patrick Dryden

AN EMERGING breed of active monitoring tools can help 15 managers maintain service levels for their users by doing more than just watching the performance of complex client/server networks.

Tools that will appear this week at ComNet '96 can help information systems managers get early warning about slowdowns by automatically testing connections and applications.

15 staff at the University of North Carolina at Chapel Hill, for example, frequently stress-test their statewide network to verify that they aren't getting onely 5 kbit/sec. speed on their T1 lines. Said Keith Johnson, network systems manager:

"The staff runs multiple streams of data across leased lines between two endpoints to measure the maximum available bandwidth using Chariot software from Gaymede Software, Inc., in Morrisville, N.C."

## ACTIVE SERVICE

Autonomous version of the tool, called Pegasus, debuts this week. With it, a server can launch test scripts at scheduled times, send alerts if response drops and store the results for analyzing trends or service levels.

Recently, Network Tools, Inc., in San Jose, Calif., shipped a test tool called Causal that can constantly run application scripts for trending. The next version will add scheduling and automation, officials said.

Microtime, Inc., in San Fran-

cisco, this week will introduce a suite of seven active Internet test modules for Netcool, its event correlator and service-level monitor.

Besides helping operators make sense of thousands of status reports, Netcool will be able to check Web servers, firewalls and file transfers by itself.

"Like service providers, enterprise IS has to take responsibility for data delivery," said Mark Bouchard, an analyst at Meta Group, Inc. "Active tools complement passive ones to help discover problems before someone else does."

Traditional tools couldn't help FileNet Inc. gauge the performance of its R3 applications from SAP AG, said Mike McCoy, MIS director.

Now, robot PCs located at all FileNet sites run the full suite of SAP R3 functions just the way users do and report back to headquarters in Costa Mesa, Calif. The active monitoring system comes from Luminate Software Corp., in Redwood City, Calif.

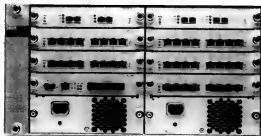
Luminate's drones and central analyzer revealed slow network response time on a LAN in Germany and flaws in a home-bank transaction, which were fixed to speed database processing instead of requiring server upgrades, McCoy said.

Two other application performance test tools recently added back-end automation and monitoring capability: ETEWatch, from Candle Corp., in Santa Monica, Calif., and VitalAnalysis, from VitalSigns Software, Inc., in Santa Clara, Calif. □

Billing services from long-distance carriers:

Product	Function
AT&T	Bundled billing for voice and data services for small customers
OneNet	Bundled contract for many voice and data services for global customers
Billing Edge	CD-ROM-based invoice analysis software
Perspective	Analyzes voice traffic patterns
Network MCI One	Bundled billing for midsize to large users
Vueit	Bundled services and billing; CD-ROM-based for largest customers
FunView	Electronic invoice analysis software for small customers; CD-ROM-based invoice analysis for large customers

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# Notes users aren't hankering for Java

► Lotus rushes to open standards; users hang back

By Barb Cole-Gomelski

LOTUS DEVELOPMENT CORP. may be facing toward Java, but its installed base plans a more leisurely stroll.

Lotus has largely opened up its Notes messaging and groupware software to the Internet. But the move to open standards, then clients and Java programming is proving to be a relatively slow one for Notes users.

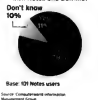
According to an exclusive Computerworld survey of 101 information systems managers at companies that use Notes, only 47% are exploring the current World Wide Web books in the product such as the ability to run a browser as a front end to Domino.

The survey also showed that only 11% of respondents currently use Java with Notes and Domino.

Callen said.

But a move to open standards is expected to lower the total cost of Notes ownership and make it easier for companies to share information with customers and

**SLOW ROAD**  
Is your company using Java with Notes and Domino?



trading partners. But moving to Internet standards also requires widespread TCP/IP networks, which some companies lack, and retraining developers on a new programming language.

"We are very eager to embrace Java because it will give us a lot more power and flexibility [than the LotusScript language]," said Jeff Schnable, director of infrastructure technology at Unilever North America Foods, in Englewood Cliffs, N.J.

Like many Notes sites, Unilever uses Microsoft Corp. applications. "I had been a very big proponent of Actix because we are so tied to Microsoft," Schnable said. "But support for Java is overwhelming."

Lotus' plan has already been to give Notes developers the choice

of building applications using its proprietary LotusScript, Microsoft's Visual Basic, C++ or Java. But the company's recent efforts have centered largely on making Notes and Domino accessible to Java developers.

Lotus will claim that it is the safest bet because they support everything," Marshak said.

At its Lotusphere '98 conference this week in Orlando, Fla., Lotus will highlight plans to expose Domino interfaces as Java components.

"[Java] is the direction that people want to go," said Jerry Vogel, MIS group manager at PNC Bank, in Pittsburgh, which has about 4,000 Notes seats. PNC's stumbling block has been its lack of tools to port Visual Basic applications to Java, he said.

## TAKE NOTE

What do you use Notes for?

Group discussions/collaborations	86%
Internal E-mail	85%
Internet E-mail	74%
Custom-developed groupware	67%
Knowledge management	64%
Workflow	59%

Base: 101 Lotus Notes users; multiple responses allowed

Source: Computerworld information Management Group, Pittsburgh, Pa.

Vogel's issue won't be addressed by Lotus because it is a problem with third-party tools. Lotus is trying to be agnostic, so it isn't offering any conversion utilities for Visual Basic. □

## IBM seeks to boost NC visibility, Java positioning

CONTINUED FROM PAGE 1

### FOLLOW THE LEADER

"Lotus is going to have to lead rather than follow its customers into this space," said David Marshak, an analyst at Patricia Seybold Group, in Boston. "There are a lot of Notes customers that are perfectly happy with Notes clients, and most sites are not committed to Java at this point."

Paul McNulty, vice president of marketing at Lotus, shrugged off the slow Java movement among customers. "It takes time to put out new technology to use," he said.

"Java is still in its infant stages," said Bruce Padmore, a developer at Millennium Productions, a Cambridge, Mass.-based consultancy that specializes in Web applications and Domino.

He said Lotus is "way ahead of just about everyone in terms of its support for Java," but user companies are still waiting for the language to mature before they make big investments in it. Ed Callen, manager of application development at Johnson & Higgins Marsh & McLennan, in New York, said the insurance company's goal is to implement open standards when it makes sense.

At this point, Java doesn't do a whole lot of real stuff."

Lotusphere '98 focus: making Notes easier to use for big shops. Page 49

been the biggest stumbling blocks to network computer adoption.

### ON THE DOCKET

Announcements slated for Lotus' annual user conference include the following:

- After a successful test run, retail giant Sears, Roebuck and Co. will announce plans to buy between 700 and 1,000 of IBM's Network Stations to run its delivery and customer-service applications.

- Lotus is expected to announce a shipping date of the end of February for its Java-based ESuite productivity application suite. ESuite offers users a graphical user interface with several apps, including a spreadsheet, electronic mail, calendar and scheduler, browser, database access tools and word processor.

- Further bolstering IBM's bid to raise user confidence in its network computer strategy, 20 vendors are expected to showcase a variety of Java-based applications at IBM's Business Partners Executive Conference in mid-February in San Francisco.

Steve Rutkowski, director of direct delivery systems at Sears, said the Hoffman Estates, Ill., company turned to Network Station Series 1000, IBM's version

of JavaStation, because it packs a high-powered PC processing punch but is highly manageable and simple.

"We think we see some benefits with this because we get all the capabilities of a PC without the full-blown expenses," Rutkowski said.

Sears wants to develop an Internet-based application using Java that will let customers track their deliveries and service.

That could eliminate about 40% of the calls to service representatives. According to Rutkowski, who noted that the company makes 4 million deliveries per year from more than 100 service centers across the country.

### JAVA BUNDLE

#### Product: ESuite

Company: Lotus Development Corp.

Price: \$49, but ships free with IBM's Network Stations

Due out: Next month

Features: Word processing, E-mail, spreadsheet, calendar/scheduler and browser

Rutkowski said ESuite, which ships free with Network Station, is a potentially useful product. But for his users, most of whom use a fixed set of applications, it has limited value, he said.

ESuite is much more to beta-tester Beverly Russell, manager of information technology at E. D. Smith & Sons, Inc., in Wynona, Ontario.

She said the application suite provides all the functionality most of her users need, and more important, extends it to terminal users who are migrating to Network Stations.

"This solves the problem of how to get users the applications they need without investing in a more expensive and support-heavy infrastructure [of PCs]," Russell said.

She said the decision about whether to go with more PCs or network computers was an easy one from a cost and support standpoint.

### IMAGE BOOST

The suite's significance for users is that it can boost confidence in network computing and Java, said Neil MacDonald, an analyst at Gartner Group, Inc., in Stamford, Conn.

"This gives IBM a Java story to talk about and a proof of their concept" of network computing, MacDonald said.

ESuite gives IBM "a Java story to talk about and a proof of their concept of network computing."

— Neil MacDonald, Gartner Group analyst

The concept is well founded. MacDonald said Gartner research indicates users can save between 26% and 35% of overall PC support costs by implementing devices such as Network Stations, which are highly manageable and easily deployed.

Still, some users said they aren't yet convinced that the proof is in the pudding.

David Frost, information systems capability leader at Owens Corning, in Toledo, Ohio, said his company found that it can get stripped-down PCs for about the cost of a network computer.

Until he becomes convinced that the network computer really offers a lower total, Frost said, he isn't sticking with PCs. □

Computerworld senior editor Barb Cole-Gomelski contributed to this report.

Falling hardware prices enhance PCs, columnist Dan Ollmer writes. Page 105



# NCR to supercharge Teradata for OLAP apps

By Craig Stedman

NCR CORP. next week will announce plans to turn its Teradata database into a turbocharger for OLAP and data mining applications, sources close to the company said.

NCR is prepping a Teradata upgrade that can take over pieces of the analysis calculations currently run on separate online analytical processing (OLAP) and data mining servers, the sources said.

That means data will no longer have to be pulled out of Teradata and reassembled on other servers. That could save valuable time for users.

The new release, which is due to ship in stages between now and July, is the first of two big changes NCR has in store for Teradata this year. The Dayton, Ohio, company also is working on a Windows NT version to free the decision-support database from its niche in the realm of monolithic data warehouses.



NT is "going to open up a lot of opportunities [for using Teradata] at the lower level."

Both the upgrade and Windows NT support will deliver features that Anthem Insurance Cos. has been seeking from NCR, said Joe Bruscatto, who is in charge of data warehouse design at the Indianapolis-based health insurer.

New data-linking mechanisms should make loading Anthem's 17-byte Teradata warehouse less complicated and time-consuming, Bruscatto said. The OLAP and data mining capabilities also are intriguing for future applications, he said.

And Windows NT will provide a low-cost way to split out slices of the data warehouse for specific users or special-case applications, Bruscatto said. "It's going to open up a lot of opportunities [for using Teradata] at the lower level."

## FOOD FOR THOUGHT

Tony Marshall, a senior technology analyst at Hallmark Cards, Inc., in Kansas City, Mo., said he also is eager to check out Teradata's OLAP and data mining capabilities. Hallmark stores more than 1 billion rows of point-of-sale data in Teradata for analysts by 300 users.

Steve Hummel, a senior warehousing product manager at NCR, confirmed that the OLAP and data mining support is being added to Teradata. NCR officials wouldn't comment further on next week's announcement.

The built-in analysis capabilities won't

eliminate the need for Teradata users to hook separate OLAP and data mining engines to the database, said Merv Adrian, an analyst at Giga Information Group, in Santa Clara, Calif. But he said the upgraded Teradata will be able to do sampling, rankings and other data calculations

itself, which should produce faster results and cut down on the heavy amount of data manipulation and pre-processing that users now have to do.

Teradata's parallel processing power also should let users analyze bigger chunks of data "that can really overwhelm some

of the OLAP engines," Adrian said.

According to sources, other new features in Version 3 Release 3 include a 40% boost in query speeds, event-based triggers; and expanded support for joining data stored in different tables.

The NT version was initially expected late last year, but NCR is aiming for a summer release, the sources said. Teradata currently runs only on NCR's own Unix operating system and hardware. □



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# Novell brings Novonyx under its wing

## Joint venture with Netscape is shipping its first products

By Laura DiDio

USERS AND ANALYSTS reacted positively to reports that Novonyx, Inc., the start-up

jointly funded by Provo, Utah-based Novell, Inc. and Netscape Communications Corp., has been folded back into Novell. The reintegration with Novell should

let users get products and aftermarket technical support more quickly than they have been, said Bob Sakakeeny, an analyst at Aberdeen Group, Inc., in Boston. "It bodes well for Novonyx that Novell wants them back in the family," he said.



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The ongoing browser war with Microsoft Corp. has made it "extremely tough going" for Netscape, he said.

The privately held venture was formed in June to integrate Mountain View, Calif.-based Netscape's Internet and intranet efforts on Novell's NetWare platform, and to leverage Novell Directory Services via the Lightweight Directory Access Protocol.

Novonyx recently began to deliver its first three products: Netscape Enterprise Server, Netscape FastTrack Server and Netscape Messaging Server.

An anonymous letter claiming to be from Novonyx employees circulated online recently, announcing that Novell has absorbed the unit and removed its president, Rob Hicks.

Interviews with Novonyx sources confirmed the letter's contents. Novell officials declined to comment beyond confirming that Novell Vice President Christopher Stone is managing the group.

Novell will clarify its position on Novonyx in a press conference to be held tomorrow in San Jose, Calif.

Netscape said it has no knowledge of the management changes.

"If Novonyx were to continue as a separate entity, [it] might turn a modest profit. But given Netscape's waning fortunes and the fact that Novell today is generally more focused under Eric Schmidt's leadership, I think tighter integration with the modernship, Novell, is a very good thing," said Josh Turlet, president of the Greater Boston Network User Group and director of information services at Ad Life Marketing and Communications, Inc., in Norwood, Mass.

Sakakeeny said that by reintegrating Novonyx, Novell is indicating that it considers the Netscape World Wide Web servers a strategic offering for the future. In an interview, Stone confirmed that Novell sees the Novonyx product family as a strategic offering.

Novonyx's reabsorption may be part of a bigger corporate mandate at Novell.

In an interview with Computerworld last week, Stone said, "The issue is to streamline the organization in a way that will impact three key strategic areas for us." Those areas are Internet-related activities (including Novonyx and Web servers), native IP for NetWare 3.0 (Moab) and application development (Open Solutions Architecture), he said.

The only group that is unhappy about the reabsorption are some Novonyx employees. According to the anonymous letter, some employees have petitioned the board of directors to let the joint venture remain a team under management independent and separate from Novell. □

Computerworld senior editor Carol Silvo contributed to this story.



**Ad Life's Josh Turlet: Novonyx's reintegration with Novell "is a very good thing"**

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# Citrix license deal moves NCs forward

By April Jacobs

USERS AND ANALYSTS argue that network computers have yet to prove themselves in either performance or compatibility. But a licensing agreement among Citrix Systems, Inc. and several leading

thin-client vendors is a step in the right direction, they said.

The licensing agreement announced recently by Fort Lauderdale, Fla.-based Citrix will let vendors, including IBM and Hewlett-Packard Co., embed its Independent Computing Architecture

(ICA) protocol in their thin-client hardware. That will give network computers access to mainstream Windows applications and other legacy systems.

The ICA protocol includes three components — for the server software, network protocol and client software — that

let thin clients process and store applications and data on a server. The client component, for example, sends the end user's keystrokes and mouse clicks to the server and updates the client's screen.

Information systems managers eager to cut the cost of managing desktop computers could deploy desktop devices that are smarter than dumb terminals but cheaper than PCs — and support them from a central location.

That approach can save companies up to 40% on total hardware and software costs during a three-year life span, according to research by Gartner Group, Inc., in Stamford, Conn.



“NCD is an overnight success at FedEx.”



**It's no surprise that Federal Express uses the latest technology to stay one step ahead. NCD delivered desktop solutions for FedEx.**

Recently, Federal Express Corporation (FedEx) replaced nearly 3,000 terminals with NCD HMDX desktop devices at 15 customer service sites across the U.S.

According to Dave Barnwell, Federal Express Corporate Director of Customer Service Technology Systems, there were three criteria for the new desktops: “First, they had to improve the job design of the Customer Service Reps. CSRs had to like it more, and have their job enriched by having it. NCD met that. Secondly, they had to improve customer service. They are doing that. Finally, it had to pay for itself. It's done that, too.”

“Centralized maintenance was also a big issue. When you think about 15 sites and that number of seats...” Now, FedEx CSRs have 17" color monitors and are running main-frame apps, customer service apps, WinCenter (which delivers MS Office apps) and the Internet. “In essence, I have four different computers, all in one desktop device,” said Barnwell. “We would make the same decision again. (NCD) turned out to be less expensive and easier to support.”

“Not only does NCD offer a very good product, they've enhanced their relationship by working more closely with us to understand our needs, and then come up with solutions. I'm very pleased.”

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## NC LICENSING

Vendors will be introducing the following products based on Citrix's ICA protocol:

Vendor	Product
IBM	Network Station (network computer)
Key Tronic	Keyboard
Sharp	Mobile (handheld computer)
Acorn Group	Internet appliance
Hewlett-Packard	Network computer

“I have a lot of support people running around here taking care of PC issues. If I were able to bring some of that care and feeding back inside the glass house and make it transparent to the end user, that's the way to go,” said Dennis Courtney, chief information officer at Dundup Tire Corp., in Amherst, N.Y.

But Courtney said the technology has to mature before it gains wider acceptance. “Until I see evidence that I can sign on and run our desktop tools in a robust environment, it won't happen. Saving money [on hardware] isn't help if it costs us productivity,” he said.

Some users said they are afraid network bandwidth requirements could offset the advantages of network computers.

“You are moving from a local problem to a central server and bandwidth problem,” said Rick Shope, manager of PC planning and technology at the Chicago Research and Trading division of NationsBank, Inc., in Chicago. Still, Shope said the idea may work for remote users because they could access applications and data from a server, which is easier to manage than far-flung PCs. □

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# Big iron catches a case of Web fever

CONTINUED FROM PAGE 1

1 million transactions per day it expects to handle this year.

Why use mainframes, once considered the dinosaurs of computing, to host a Web site? "A mainframe scales much more than NT or Unix servers. And they are light-years ahead of both in availability and manageability," said Carl Gremet, an analyst at Meta Group, Inc., in Stamford, Conn.

Don't expect mainframes to

SpeedServe's Web site averaged 10,000 hits per day. It now averages 100,000 hits per day.

Instead of throwing more NT servers at the problem, the company called in the heavy artillery an IBM S/390. "We looked at this from a long-term cost perspective. With Windows NT, it meant more machines and more people to manage them," Mason said.

Mason didn't provide dollar

strengths—becomes a key issue because online companies don't want disappointed Web customers or closed storefronts. High profile server glitches such as the one that closed Amazon.com for 11 hours recently are raising some concerns about the reliability of other Web server hardware (CWI, Jan. 12).

## CLOSE DATA

Putting the Web site on an existing mainframe also means the mainframe data that Web browsers need is close by and doesn't have to be moved to or fetched from another system.

"With all the core data that is on the mainframe, it can really be quite a problem to move it to another system," said David Floyer, an analyst at International Data Corp., in Framingham, Mass. "You could lose a lot of the benefits of the Web application in the process, especially in real-time situations."

Merrill Lynch & Co., for example, is running a crucial stock market data Web site on an existing 10-engine Amdbal Corp. mainframe that runs in an IBM VM operating environment. Users can pull down stock quotes, get information on the most actively traded companies, track market declines or scan their portfolios.

The decision to host the site—which drew 18 million hits last year—on the mainframe was simple, said Jeff Savat, a vice president at Merrill Lynch, in New York. "The data was all on the mainframe. The Web was the obvious way to liberate it."

By linking Merrill's constantly updated market information to a Web server and making the information accessible via stand-alone browsers, the company can easily pump the latest information into the hands of its inter-

nal users, clients and external Web users, Savat said.

The incremental cost of setting up mainframe-based Web servers could be less than the cost of buying new servers. The mainframe likely already has the data, processing power, connectivity and support staff.

Consequently, "We didn't have to worry about start-up costs" for a mainframe-based Web site, said Annette Miller, lead technical support specialist for the city of Lincoln, Neb.

The city of 210,000 uses a Windows NT Web server for some of its pages, but because so much of its data still resides on the mainframe, officials have the mainframe act as a Web server and host its own pages.

## EASY CHOICE

"And when IBM integrated Internet Connection Server with the OS/390 operating system, along with the CICS and DB2 connectors, it was really a no-brainer," Miller said.

The Rochester Institute of Technology (RIT), in Rochester, N.Y., is taking the same approach by hosting a student information system Web site on its S/390 mainframe.

In addition to general information about RIT, the Web server allows the institute's 13,000 students to access registration, academic, grade and billing information from anywhere in the world via the Web.

"We have seen other universities take their mainframe data and download it on NT servers," said Daniel Vilemski, RIT's registrar. "We believe this is an economic alternative to doing that."

## RISKY BUSINESS

But hosting a Web server so close to vital corporate data does pose a security risk, users and analysts agreed.

Still, security issues for mainframes are far better understood than they are for NT or Unix platforms, analysts said. Mainframes have years of experience with access controls for dial-up users, and partitioning technologies and firewalls can keep Web users and databases separated.

Despite the advantages, the high costs of mainframes will keep all but the most resource-hungry Web applications on Unix and Windows NT boxes for awhile, analysts said. An entry-level S/390 starts at \$500,000 without software.

Still, mainframe vendors IBM, Sunnyside, Calif.-based Amdbal and Santa Clara, Calif.-based Hitachi Data Systems Corp. are coming out with rela-

## Webifying mainframes

Most Web sites have their computer processing distributed over at least three platform forms: a Web server, a firewall and an application or data server.

But IBM is leading an effort by mainframe vendors to perform electronic-commerce transactions to consolidate everything on one mainframe.

The company has already integrated several Web hooks into its OS/390 operating system and is offering a range of firewall and encryption technologies to boost its Web presence. IBM's Internet Connect Secure Server, for instance, lets users integrate Web servers and supporting applications on a mainframe.

The company in March will complete a rewrite of its TCP/IP stack for OS/390, which will boost performance for clients attached to a mainframe Web server. At the same time, IBM will make new cryptography features available in its Net.Commerce software for the mainframe.

Also, IBM is taking a piece of its mainframe clustering technology and making it available in the OS/390 Web server. Browsers at certain locations will gain high-priority access to the Web server and certain files can be accessed faster than others.

This new job for the mainframes comes at a time when Web-based applications are becoming more important to corporate America.

"In order to survive, IBM has to do this and do it well. [Otherwise] people will just move their mainframe applications to another platform," said David Floyer, an analyst at International Data Corp. — Jalsumar Vijayan and Tim Ouellette



Rochester Institute of Technology IS manager Peter Kulpe and registrar Daniel Vilemski say RIT's Web site is an economic alternative to downloading mainframe data onto NT servers

replace Unix or Microsoft Corp.'s Windows NT as Web servers everywhere, though. Big iron costs big money. And so far, not many Web applications require mainframe horsepower.

## CHANGING TIMES

But that will change as electronic-commerce volumes grow and customers demand mainframe-like performance, uptime and integrity.

"It is one of these things creeping in from left field," said John Young, an analyst at The Clipper Group, Inc., in Wellesley, Mass. "But there is no doubt it is a growing trend."

SpeedServe is a pioneer. As recently as last summer, the La Vergne, Tenn.-based company ran its online store on a Windows NT server. But it was handling more than 500,000 book titles, 85,000 videos and 15,000 games and mailed out its NT hardware.

"We ran into a ceiling with our NT architecture," said Michael Mason, one of SpeedServe's founders. At that time,

figures, he said the payoff for the substantial up-front investment in a mainframe is lower labor and support costs and no worries about hardware upgrades or networking issues.

SpeedServe is using only three of the mainframe's CPUs, so it has plenty of room for growth and spikes in transaction volume.

As Web commerce matures, reliability — a mainframe

## Mainframes make great Web servers ...

### ADVANTAGES

- **Data is already on the mainframe:** Why move it to a separate Web server?
- **Terrific scalability:** Lots of room for growth
- **Reliable:** Stays up pretty much all the time
- **Secure:** It's harder to crack into a mainframe than Unix or NT

... but don't expect them to take over the Web

### DISADVANTAGES

- **High entry costs:** Have you bought a mainframe recently?
- **Too much capacity:** Most Web applications don't need that much horsepower yet

tively inexpensive mainframes geared to Web site duties.

And IBM is offering integrated Web server software, firewall technologies and integration services.

In essence, the mainframe will become just another option, like Windows NT and Unix, for hosting Web sites. The decision will be driven by applications, business needs and economics.

"People can get so religious about the different ways of doing these things. The mainframe is a great alternative" to multiple servers and the associated labor costs, Savat said. □



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# QUICK STUDY

Hot trends & technologies in brief

## THE PLAYERS

- The directory service market is highly fragmented, with no one vendor dominating the space. The largest segment — about 35% — comprises LAN-based E-mail systems, such as Microsoft Corp.'s Mail and Lotus Development Corp.'s CC:Mail.
- Novell, Inc. leads the pack of stand-alone directory vendors. About 17% of companies with directory services use Novell Directory Services. Next in line is Lotus Notes with 7% and Microsoft Exchange with 5% of the market.
- Banyan Systems, Inc.'s StreetTalk, once viewed by many as the only viable choice for an enterprise directory, has seen its market share dwindle to a mere 3%.
- Control Data Corp. has 6%, the largest slice of the X.500 directory service market.

Source: The Radicati Group, Palo Alto, Calif.

## THE STANDARDS WAR

	X.500	LDAP
Pros	<ul style="list-style-type: none"> <li>• Supports chaining (finding a user who can't find a directory to where the information is)</li> <li>• Supports replication</li> </ul>	<ul style="list-style-type: none"> <li>• Runs on PCs and network computers</li> <li>• Faster than X.500</li> <li>• Easier to implement than X.500</li> </ul>
Cons	<ul style="list-style-type: none"> <li>• Difficult to implement</li> <li>• Too large for most PC clients</li> </ul>	<ul style="list-style-type: none"> <li>• LDAP standard is still developing</li> <li>• Current LDAP products don't support chaining or replication</li> </ul>

Did you know?

- 1 A company with 50,000 end users will spend \$2.5 million to \$3 million during three years to deploy a corporate directory. In spite of that cost, a company can expect a return on investment of 300% in those three years.
- 2 According to a recent survey of 98 IS

professionals, 21% plan to purchase and deploy LDAP directories in the next year. Only 10% of those surveyed planned to purchase X.500 directories.

- 3 27% of those 98 respondents have an X.500 directory installed.
- 4 42% of 50 IS managers surveyed use a

## Electronic directories

**DEFINITION:** A directory is an electronic Yellow Pages. It holds information such as E-mail addresses, Social Security numbers, digital signatures and other security information. In many companies, information is scattered across several proprietary directories. For instance, E-mail addresses are held in a messaging system, while date-of-hire information is locked up in a human resources application and network IDs are kept in the network operating system's directory. A directory service is a software application used to track employee and security information in the directory. Directory standards — such as X.500 and LDAP — define a format for storing and accessing that information.

## Security through directories

By Barb Cole-Gomella

DIRECTORIES HAVE TAKEN ON more importance recently because they are key to deploying electronic commerce. They can hold digital signatures and other security information for bulletproof transactions on the Internet.

"In order to put real security in place, companies require an integrated directory for storing names and passwords for their users," says Sara Radicati, president of The Radicati Group, a research firm in Palo Alto, Calif. An integrated directory — essentially a list of all disparate directories — saves IS staff time and money because they no longer have to keep multiple directories in sync.

Besides electronic commerce, companies are deploying directories to keep pace with the widespread implementation of IP networks and the rapid growth of intranet applications, according to Dan Blum, a principal at Rappert Communication in Washington.

To integrate directories, IS managers must select a directory standard from among many choices. There's the sophisticated X.500 protocol or the slimmed-down IP version of X.500 called Lightweight Directory Access Protocol (LDAP). There's also a host of proprietary directory standards, such as Novell, Inc.'s Novell Directory Services.

Microsoft Corp. is expected to roll out its Active Directory as part of Windows NT 5.0 later this year. That will add to the confusion over

which directory standard to deploy, Radicati says.

"There isn't one [directory standard] answer for everybody," she says. The answer should be based on a company's computing environment and how much time and money it wishes to spend on a directory project, Radicati says.

The X.500 standard is costly and complex, but it supports features — such as replication — that make it possible to construct a centralized directory. LDAP is easier to implement

### AT ISSUE Integrated directories

than X.500, experts agree, but it's unclear whether LDAP will be up to the task of tracking the complex data types required for electronic commerce. The standards emerged because managing multiple directories was expensive — and without a directory standard, it's virtually impossible to keep information in multiple directories consistent.

No matter what the underlying format, LDAP is expected to be supported by Web browsers, which will give users access to LDAP directories. For that reason, almost every serious directory player has announced plans to support LDAP. But it's way too early to call a winner in the directory standard or integrated directory match. □

## QUICK STUDY ONLINE

For links to reports, books, organizations and vendors, go to: [www.computerworld.com/home/online662.nsf/all/qsd\\_directorieslinks](http://www.computerworld.com/home/online662.nsf/all/qsd_directorieslinks)

## FACTS AND STATS

manual process to keep directories in sync. 12% don't bother trying.

- 5 From the same survey, 52% believe that the Internet will make directory chores worse.

- 6 There are more than 70 software products on the market that support LDAP.

Source: The Radicati Group, Palo Alto, Calif. © 1998 Forrester Research, Inc., Cambridge, Mass. All rights reserved.



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With SmartSlot™-equipped Smart-UPS rack-mount server and internetworking equipment protection, you can diagnose problems before they can cause downtime. You can also contact your Smart-UPS through an out-of-band modem link, check the power events log and diagnose any problems without leaving your desk. Then you can reboot the remote server with one click. You can even wire your security system right into your NMS to keep your hardware safe from vandals, thieves or from unauthorized access.



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## OPINION

## Trading places Companies such as Netscape, Yahoo and Marimba have the buzz.

But to see where things really stand in the computer industry, follow the bucks. Five years ago, the list of the Top 5 computer companies, based on annual revenues, looked like this: IBM, Hewlett-Packard, Digital, Unisys, Apple.

IBM especially was a goner. Mainframes were history, OS/2 was a dog, and IBM's new CEO was a guy named Lou who didn't know a MIP from bean dip.

But IBM has prospered. The company has grown from revenue of \$65 billion in 1993 to \$78.5 billion today. Big Blue remains No. 1, and no one else is even close.

Five years ago, HP and Digital were pretty much in the same boat: highly successful companies facing

painful transitions. HP succeeded; Digital didn't. HP doesn't have Java, it isn't hard-core about the Internet, and you don't see Lou Platt reciting Top 10 lists during Comdex keynotes. But HP exploded from \$16 billion to \$43 billion, to stay No. 2. Meanwhile, Digital shrank from \$14 billion to \$13 billion.

It's the same story with Unisys and Apple. Unisys went from \$2.4 billion in 1993 to \$6.6 billion last year. Apple was at \$7.1 billion in 1992, \$11 billion in 1995 and back to \$7.1 billion in 1997.

The new powerhouses are the Wintel crowd. At No. 3, there's Intel, which grew from \$6 billion in 1993 to \$25 billion last year. That's a lot of Pentiums.

Next is Compaq, which went from \$4 billion in 1993 to nearly \$25 billion last year. By comparison, Dell is at \$10 billion.

And I'm putting Microsoft at No. 5. Technically, Digital had higher revenue last fiscal year, but Microsoft has passed Digital in the latest quarterly earnings and is strutting beyond the \$13 billion mark.

That's pretty astounding for a software company. Will the new breed of internet-based companies ever crack the Top 5 list? Tune in again in 2002.

*Neal Weinberg*

Neal Weinberg, assistant news editor  
Internet: neal.weinberg@cw.com



## Advice to Microsoft was on the money

I WANT TO THANK Computerworld columnist David Moschella for setting the record straight on the role of government in regulating monopolies ("Memo to Redmond,"

### Memo to Redmond:

By Di.

THEY'RE NOT THE ONLY government like business operating in a free-market economy, and should back off from any attempt to regulate Microsoft, ask how two simple questions:

1. If you were a Microsoft executive, would you want to be a government official? 2. If you were a government official, would you want to be a Microsoft executive?

Intervention is inevitable," CW, Nov. 24).

Though it's true the federal government does a lousy job of running businesses, it's equally true that totally unrestricted business is not healthy either. Most of the articles and opinions I have seen on the subject miss the big picture by

a mile. I grind my teeth every time I see some whining that "Microsoft doesn't have a monopoly. Look at Netscape's market share." But it's not about browsers — it's about operating systems. It's about the fact that Java and Netscape threaten the Windows monopoly.

Mark van der Hoff  
Hemet, Calif.

DAVID MOSCHELLA's proposal to rein in Microsoft was by far the most practical piece of journalism I've seen anywhere on the Department of Justice vs. Microsoft debate.

I was especially enthusiastic about his guideline to operate on Internet time.

As a longtime software industry participant (most of the time in the very shadow of Microsoft), I would like to see Microsoft continue its growth with simple guidelines such as the ones Moschella proposed.

Tom Lynch  
President and CEO  
ZebraSoft, Inc.

## Men over 50 also battle obstacles in workplace

I REALLY ENJOYED LAURA DiDio's column about the difficulties of being talented, over 50 and female ("Over the hill," CW, Jan. 12). I empathize with anyone who does well on the telephone only to "disappoint" in person.

This is not just a female issue. As I near 60, landing new business gets more difficult for this very reason. It used to be that I'd

win about 90% of the business I pitched. Now I'm looking at half that. There's still plenty to keep me busy, but I keep scratching my head about folks who need me most but don't get it.

In every case in memory, they were much younger.

Keep up the good work.

Murry Shokat  
Santa Rosa, Calif.

## Technology evangelists fill role in adding business val-

COMPUTERWORLD's story on IT "evangelists" was great ("Gadgets 'R' us," CW, Dec. 15). Without evangelists, some technologies would never see widespread adoption.

I think there's a role for what I call technology marriage brokers, in which individuals work at pairing up new technologies with appropriate users while trying to stay dispassionate about the specifics of the technologies themselves.

I was in a role like that myself for a while. It was great fun to keep an eye on the business requirements of the organization while being very creative about how new technologies could help solve problems or open new markets.

Thanks for an encouraging article.

Scott R. Lucado  
Fort Worth, Texas  
rlucado@aol.com

We need technology marriage brokers.

Computerworld welcomes comments from its readers. Letters shouldn't exceed 200 words and should be addressed to Marilyn Johnson, Executive Editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01901. For number: (508) 875-8931; Internet: letters@cw.com. Please include an address and phone number for verification.

# Help wanted? Not on your life!

Michael Cohn

**W**e are in crisis. Hooray! American business is at a standstill. Rejoice! Why? Because there aren't enough people. Projects are on hold. Slots go unfilled. There is a worldwide shortage of high-tech help, the likes of which we've never seen.

Some 70% of America's CEOs say they are struggling because they can't find good programmers. The remaining 30% say they are struggling because the programmers they've got aren't the sharpest knives in the drawer.

But for those of us who still slave away in the bowels of the information systems department, this is great. ISers have inherited the earth. We're noticed! We're loved! We're in demand!

Chief financial officers hug us in the hallway. Java is revered. Cobol is king. If you can move a mouse, there's a six-figure salary waiting for you.

**It's an employment nightmare - and I say let's keep it that way.**

Except someone out there is screwing this up.

Real forces are flexibly recruiting regular folks from all walks of life and turning them into techies. School teachers. Janitors. Congressmen. Normal people are nabbed off the street, trained for six weeks and tossed into 207-byte data warehouse projects.

Come on, what kind of seasoned IS staffer do you get after six weeks? I've

been at it 18 years, and I still can't figure out a nested-if.

But if you're an aspiring high-tech professional, a college student about to enter the market or just one of those pesky end users who thinks they've got a handle on Lotus Notes, I've got a message: Leave us alone. Get lost.

We like it the way it is. Sure, we're overworked. Sure, our jobs are as much fun as a root canal.

But you folks are making it worse. They're offering you the big money. You're stealing our perks. Recruiters show you the plush offices — while I'm stuck in a cubicle with Sam the showerless LAN administrator.

## WORK ON RETENTION

Executives: I know you have to do something to fill tomorrow's ranks.

But why bother? If you took every student in technical school, every IS major, every business school graduate and put them in the job market today, you'd still be thousands short.

You simply can't find job-hungry, bright and talented people anymore (unless you skip the "bright and talented"

part — then you can just check any law school).

Look around.

There are more outsourcers, more start-ups, more year 2000 projects snapping up the good, the bad and even the ugly.

It's an employment nightmare — and I say let's keep it that way. Recruiting's OK, but retention is even better. So heap on the bonuses! And the baseball tickets. And more bonuses. And expensive furniture. And did I mention bonuses?

I keep my fingers crossed. Maybe it can be like this forever. Turnover reigns. For every job that's filled, two open up. Which means my career's on fire. I'm no superstar, but I'm making great money.

I'm hardly cream of the crop, but I'm moving up. Pretty soon I'll have more visibility, more responsibility and more seniority than I ever dreamed of.

Because pretty soon, I'll be the only one who hasn't taken a better offer and taken off ☐

*Cohn, who knows almost all the main-frame languages that appear on his resume, is trying to cash in in Atlanta.*

# Wake me when Zero Administration arrives

Brett Arquette

**M**icrosoft continues to fight the emergence of the thin client by promising data processing managers the Holy Grail — "Zero Administration." Nothing so far indicates that Microsoft is anywhere close to that lofty goal.

For 20 years, information systems managers have taken for granted users' ability to self-manage simple things such as printing and logging on to read E-mail.

It's amazing how complicated Microsoft has made these basic tasks. And if they can't make the basics easy, God help us when they tackle the hard stuff.

## PROFILE OVERLOAD

If you use Microsoft Exchange, you already know how profiles work. You must build a profile on your PC to access your Exchange mailbox. If your organization has users who use several different PCs and who don't understand how to create a profile, then you have a massive management headache. Such is the case at my organization.

We installed PCs in all our 25 courtrooms. A single PC may be required to hear cases in several different courtrooms a

day. That would require the judge (actually, our IS department) to build a profile for each judge on each PC he uses.

It gets worse.

Each user may have specific items added to his Microsoft Outlook personal information manager, such as special calendars.

Those items have to be manually replicated each time a user profile is built. Outlook profiles are the single biggest management task we encounter each day, and Microsoft could have easily solved the problem.

How? Store the profiles on the server. The server should cough up the user's profile as soon as the Outlook client is fired up. It's a no-brainer.

A technical spokesman for Microsoft's Exchange division says they are aware of the profile problem. He says there may be some

relief with the Active Directory planned for Windows NT 5.0.

Another problem is printers. Experienced users find changing network printing destinations easy using Windows 95. They go to the "Printers" icon and click "Add a Printer."

If they know what a network printer is and can remember the name of the print server, they have a good chance of changing printer destinations, unless the printer requires drivers that aren't embedded in Windows 95. That's when they call IS. Why should a user be forced to walk through five screens just to print to a different printer?

The menu should offer users two choices: local or network printer. If you choose network, an entire list of network printers

should pop up. The operating system should dynamically load the print driver behind the scenes.

Adding network printers with Windows 95 is hit and miss.

At least half the time we receive a driver error and are forced to build the local printer then change to a network port. The technical person I spoke with at Microsoft didn't seem to be aware that there was a problem managing printers.

Maybe my users aren't smart enough. They just moved off a mainframe E-mail system and are used to logging on from any terminal in the county and printing to any printer by simply typing in the printer name.

Or is the problem systems that require advanced knowledge for common tasks?

If Windows 95 and future versions of NT and Exchange don't address the basic problems that plague IS managers, how can we ever hope to implement automated software updates using them?

If Zero Administration is almost here, wake me when it arrives. I'll be setting up profiles and printers. ☐

**Microsoft systems require advanced technical know-how for simple tasks!**

*Arquette is director of IS at the 9th Judicial Circuit Court in Orlando, Fla. His E-mail address is bjaqq@jag.net.*

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Three white LEGO bricks are arranged in a triangular pattern on a dark, textured background. The bricks are interlocking, with the top brick's studs fitting into the holes of the two bottom bricks. The lighting creates strong shadows, emphasizing the three-dimensional shape of the bricks and their studs.

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# Corporate Strategies

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## Briefs

### SHOPPING LIST

In what technology area will you spend the most IT budget resources this year?



- Year 2000 Client/server application development
- LAN infrastructure
- Intranet applications
- Internet access
- Windows 3.x-to-NT migration
- Mobile computing
- Data warehouses
- Other

Base: 1,400 companies, mostly based in the U.S.  
Source: Research Group International Group, Inc., Stamford, Conn.

### Detail specs published

A set of global standards for commerce over the Internet is available at [www.oup.org](http://www.oup.org). The Open Trading Protocol standards — supported by companies such as MasterCard International, Inc., in Purchase, N.Y.; and Mondex International Ltd., in London — are a framework for multiple forms of electronic commerce. The protocols build on Extensible Markup Language.

### Selling power via 'net

Five Florida utilities have agreed to buy and sell electric power capacity over the Internet and other electronic facilities — including Florida Power & Light in Miami; Tampa Electric Co. in Tampa; and Florida Power Co. in St. Petersburg — are using a system that was developed by IBM and Siemens Transmission & Distribution Software Inc. (SDSI), an IBM subsidiary. Users can access the postings at the ENX OASIS World Wide Web site ([www.enx.com](http://www.enx.com)).

## Visa expands outsourcing deal

► 'Partnership' with DMR helps company serve big customers

By Julia King

BACK IN 1995, Visa International, Inc. had no choice but to farm out development of the customizable reporting software it provides as a service to large corporate customers worldwide.

At the time, Visa's 1,000-person IS group lacked the expertise needed to build the new client/server-based InfoSpan software package.

Outsourcing was obvious; but to whom, and how?

At a time when almost 25% of outsourcing contracts are canceled because of poor quality and high costs, what happened between Visa and Montreal-



And Visa has extended DMR's original multimillion-dollar contract to include ongoing maintenance and support of the InfoSpan software, which has been rolled out to more than 300 corporations since July.

"It was a true partnership," said Ronald Prather, project manager and vice president of

DMR not only said yes, they could do something, but then they said how they would do it.

based DMR Consulting, Inc. over the next 18 months is the stuff of which outsourcing fairy tales are made.

The InfoSpan project came in on budget and on schedule.

information systems at Visa's commercial card division in San Francisco.

### INTRANETS

## Schwab gets SMART with reporting app

By Laura DiDio  
SAN FRANCISCO

CHARLES SCHWAB & CO.'S new customized Web-based analysis reporting application is giving the brokerage some clear-cut business advantages: It can now spot and fix trading errors within hours; identify market trends; and keep up with the latest regulatory and tax law changes.

Code-named Schwab Metric and Analysis Reporting Tool (SMART), the World Wide Web-based application is being piloted by 250 users in Schwab's Integrated Consulting and Audit Department (ICAD).

SMART will be the foundation for a companywide intranet that will allow the brokerage's 11,500 employees to find and create trading orders, said Mike Sidel, ICAD's director of information systems. The SMART

Schwab, page 44

By Thomas Hoffman

AFTER MORE THAN A YEAR of political infighting and legal battles over a controversial IS outsourcing deal, Westchester County, N.Y., is bringing its technology operations back in-house.

Leading the way is new Chief Information Officer Norm Jacknis, a former health care industry executive who hopes to resuscitate the county's operations through a series of strategic initiatives.

### IBM DEAL

The County last January entered into a seven-year, \$85 million information technology outsourcing pact with IBM [CW, Jan. 27, 1997].

But that deal, which was orchestrated by former County Executive Andrew O'Rourke, was challenged by the county's board of legislators and employees' union.

A New York state judge even-

tually shot down the deal, finding that O'Rourke lacked the authority to outsource the county's information systems department.

O'Rourke, who opted not to run for reelection in November, was replaced this month by Andrew Spano. Spano asked Jacknis to become the county's new CIO.

The two already knew each other. They met when Jacknis was serving as chairman of the Westchester Alliance for Telecommunications and Public Access, a grassroots group formed to increase the county's Internet use.

Jacknis also had been a contractor for the county while at Level 8 Systems, Inc. in New York. He saw the offer for his first-ever CIO role as a great opportunity.

Spano looks at IT as an in-

The partnership began in the fall of 1995, when Visa selected DMR over nine other systems integrators, several of which came in with lower bids. But because this was a software package that would go out to Visa's customers, quality and on-time delivery — not cost — were Visa's main concerns.

Prather also wanted to know precisely how each bidder planned to execute the project — a question DMR answered by laying out a full-blown project methodology complete with all participants' roles and titles. Most other bidders, by contrast, offered more one-word replies to Prather's requests for descriptions.

"We'd get [requests for proposals] back, and the answer to

Visa, page 44

## County reclaims IS after debacle

strument to move the county into the 21st century, a different approach from other government leaders, Jacknis said.

Jacknis, 51, reports directly to Spano and sits 20 feet down the hall from him in the county's White Plains, N.Y., executive offices.

"When I go out, I'm speaking on behalf of [Spano]," Jacknis said. "I know a lot of CIOs who don't have that kind of access to their CEOs."

Apart from Spano's support, Jacknis will have his work cut out for him. Under IBM's supervision, the county's core applications and IT infrastructure were left largely untouched.

As Jacknis plays catch-up with Westchester's year-2000 problems, he plans to fix about 40% of the IBM and Unisys Corp. mainframe code and replace 30% of the systems with

County, page 44



Westchester Systems Analyst Norm Jacknis is the real deal.



Westchester County's 100-person IS staff will undergo a lot of retraining.

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## Visa expands deal

CONTINUED FROM PAGE 41

a question would be 'yes,' Prather recalled. 'DMR not only said yes, they could do something, but then said how they would do it.'

Under DMR's methodology, two project managers — Prather from Visa and Real Rochette from DMR — coordinated the effort, setting schedules and tracking completion dates.

Prather also served as the project's asset manager — usually a separate role — responsible for content of the new software package.

That package was developed in PowerBuilder and uses a Sybase, Inc. relational database management system.

**"After putting together a plan and seeing the vendor meet dates on that plan, credibility gets established"**

— Ronald Prather

### Visa

In another unusual twist, virtually all the development and programming work was done off-site by about 40 DMR staffers in Quebec City. That way, Prather said, Visa saved hundreds of thousands of dollars it would have otherwise paid to lease office space.

And Canadian labor rates were cheaper than U.S. rates.

Still, that wasn't the original plan. Visa had intended for several of its IS staffers to work on the project, learning the skills they would need to maintain

the new software.

"But as we got into it, we didn't have enough resources to do everything we wanted," Prather said. "We continued to pull them [Visa employees] from the project so that by the end, we had no one who could run what was developed."

That is the kind of circumstance that makes outsourcing application development in a tight IS labor market especially risky, said Lisa Maio Ross, a senior analyst at International Data Corp. in Framingham, Mass.

### RELIABILITY FACTOR

Moreover, "outsourcing an entire project to a development firm makes a [user] company totally reliant on an outsider — not only for completing the project, but also for understanding their business needs and competition," Ross said. "It's a very risky venture for a company to rely on an outsourcer for a full-scale, mission-critical application development project."

Visa nonetheless maintained control over the project. Prather and Rochette said. "When we designed a report, we'd show it to the user, who would provide comments and feedback and approve it," Rochette said. "The user had control all the way and knew what was going to happen."

Such exchanges went a long way toward assuring Prather that DMR would indeed deliver what Visa had specified, he said.

"After putting together a plan and seeing the vendor meet dates on that plan, credibility gets established. After a while, you just settle in," Prather said. □

## Schwab gets SMART with new analysis reporting application

CONTINUED FROM PAGE 41

application also will deliver updates on Securities and Exchange Commission regulatory changes, he said.

Because SMART is a Web-based intranet application, there are immediate cost savings in manpower and administration. For starters, Sidell and two Schwab software developers were able to build SMART in only six months. Total capital outlay was just \$50,000.

### TIME SAVER

A major payback comes in using the intranet application to collect information for audits on the company's finance controls and risk assessment systems. Sidell said the process should take less time — 100 hours instead of 600 hours, using one or two people. Previously, Schwab used as many as four employees for the same project. Catching stock trading errors before the transaction is completed is another dividend. Schwab, with more than \$2 billion in annual revenue, has seen its stock trading volume soar from about 100,000 trades per day to its current level of about 150,000 trades daily, Sidell said. "Increased volume means more chances to make errors," he said.

Currently, the brokerage reactively captures errors — typically stock prices or the incorrect stock symbol — via error reports that can take three days to show up.

"SMART will let us proactively catch any errors within hours, often before the transaction has gone through," Sidell said.

Armed with a \$50 million IT budget for 1998, Jacknis plans to use the county's existing TCP/IP network to provide greater Internet access to local agencies.

One planned extranet project will post information about criminal arrests to local police departments countywide.

To support the county's shift to Windows NT and expanded use of Unix, Jacknis plans "a lot of retraining" for the county's 100-person IS staff.

County IS staffers seemed excited about the upcoming changes. "This is a great opportunity — we're looking forward

### Brokerage taps intranet

The new Schwab Metric and Analysis Reporting Tool (SMART) is a Web-based application that will provide Schwab workers with a cornucopia of information. Among the top features of the site are the following:

- Business and competitive landscape information
- Departmental news and information
- Internal employee discussion database
- Risk assessment framework
- Virtual online training classes

Robert Almeida, ICAD's senior vice president, said he is looking forward to gains in productivity and efficiency once the SMART site is complete.

Embedded within the SMART application is a risk evaluation template that con-

sumers' experience," he said. Among the nine most risky categories are customer satisfaction and the value of proprietary assets at risk, including market, credit and operating risks, he said.

The result: ICAD users will be more productive, informed and more expert in their ability to do risk analysis.

"Ultimately, [the availability of these tools] will increase the precision of our decision-making process," Almeida explained.

Dick Lam, an associate in ICAD who performs risk assessment, said access to all that information will help him do his job better.

"It's a powerful tool that puts information at my fingertips and gives me a very comprehensive view of all of Schwab's activities," he said.

The SMART application also is proving to be a boon for new workers who can access the discussion database to ask fellow employees questions.

Another section of the SMART site, called Virtual Training, introduces newcomers to company policies and procedures.

Bob Sakakeeny, an analyst at Aberdeen Group, Inc. in Boston, said SMART is ahead of the curve.

"Loss of businesses have intranets, but at this point they're pretty standard. Schwab has raised the bar by building such a varied application that will have an immediate impact on its business and the way its employees work and get their information," Sakakeeny said. □

**SMART "is a powerful tool that puts information at my fingertips and gives me a comprehensive view" of Schwab activities**  
— Dick Lam  
Charles Schwab

ains nine categories of risk for Schwab's financial services organization, Almeida said.

Schwab defined its internal risks through "the prism of our

to getting back to work," said Kay Foster, an application development project leader who is part of Jacknis' transition team.

Foster said several of the outsourced staffers who were out of work took Windows NT classes and set up NT systems at home on their own time.

"This is what we've worked for," said Luigi Martino, who has been county systems administrator since 1974.

Martino also was part of the IS staff's court battle to name an in-house CIO to revamp the county's operations. "We think Norm Jacknis is the real deal," he said. □

## County tries to reboot IS after outsourcing debacle

CONTINUED FROM PAGE 41

Unix and Windows NT-based applications, such as Microsoft Corp.'s Office and Exchange.

The other 30% of the county's data-sensitive systems will be retired. Those include a lightly used mainframe-based personnel reporting system that has been "faced" to the county's overnight production runs for years, Jacknis said.

Jacknis, who plans to split

year 2000 software remediation between internal staffers and contractors, said he expects to name a year 2000 director by the end of this month — once the other half of the county's 150 information systems employees and contractors are back on board.

IBM is scheduled to turn over the county's IS operations to Westchester County by March 1,

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# The Internet

Electronic Commerce • The World Wide Web • Intranets

## Briefs

### Book buying takes off

Sales at BarnesandNoble.com have doubled in each of the first three quarters, and executives said they expect revenue to top \$50 million this year. For the nine-week holiday season ended Jan. 5, sales were \$5.6 million. Quarterly revenue for the period ending Jan. 31 will be an estimated \$3 million. The online subsidiary of bookstore Barnes and Noble, Inc., in New York, announced plans for more advertising and recruiting for the site this year.

### Explorer 4.0 ready to go

Microsoft Corp. last week released its Internet Explorer 4.0 Web browser for the Windows 95 and NT 5.01 platforms. New features include a Hypertext Markup Language (HTML)-based Outlook Express mail client; Explorer bars that permit split-screen views of search requests and results; Web site subscription capabilities; and dynamic HTML and Java support. Users can download the browser at [www.microsoft.com/ie/](http://www.microsoft.com/ie/).

### Internet faxing

Microsoft also has announced plans to include fax software from Symantec Corp., in Cupertino, Calif., in its Outlook 98 groupware and messaging client. The Windows Starter Edition, which will be designed for Outlook, will provide integrated fax capabilities for Internet electronic mail users, the company said. Outlook 98 is expected by midyear.

### BULLISH ON INTRANETS

Companies with intranets deployed

41%

22%

Notes users

Non-Notes users

Base: 15 professionals at 301 companies  
Source: Business Research Group, Newton, Mass.

## Web makes EDI flexible, E-commerce easier

### ► Outsourcer offers pay-as-you-go service

By Carol Sliva

FOR ABOUT 20 YEARS, Great American Knitting Mills, Inc. has been involved in electronic data interchange (EDI) with its major trading partners, such as Federated Department Stores, Inc., Sears, Roebuck & Co. and JC Penney Co.

But the Burlington, N.C.,

sack maker wanted to expand its market to smaller retailers that didn't have EDI systems, and it didn't want to have to supply them with software.

Val Zumbro, the company's director of information services, figured an Internet-based system would work best. But because his employees didn't have expertise in that area, Zumbro

hired a small Fairfield, N.J.-based company, DynamicWeb Enterprises, Inc., to build and set up a password-protected Web site and catalog for partners and sales associates.

"We are an AS/400 midrange shop. This is one case where outsourcing made sense," Zumbro said. "It means I don't have to deal with the server and security issues."

Other companies, too, are looking to DynamicWeb to extend their EDI systems via the Internet, rather than forcing smaller trading partners to build traditional, expensive EDI systems that require users to send the standards-based forms over a private network.

Longtime EDI vendors such as General Electric Information Services and Sterling Com-

merce, Inc. are moving in a similar direction, said DynamicWeb President James Conners. But with lower entry costs and added services, DynamicWeb hopes to attract companies looking to outsource.

The system also is appealing to some companies that don't use EDI.

### Industry analysts expect more companies to outsource electronic data interchange projects.

Clipperton Co., a Satellite Beach, Fla.-based maker of upscale brass shower curtain rings, couldn't be happier that

its customer, Linens 'n Things, set up an Internet-based ordering system using DynamicWeb. Now Clipperton simply logs in to the Linens 'n Things World Wide Web site, collects purchase orders, processes them and electronically sends back invoices. All Clipperton

Outsourcers, page 48

## Web-caching servers cut network costs



By Bob Wallace

EARLY users are finding that proxy servers, which boost Web browser response time by caching frequently accessed Web pages locally, also are saving them money on wide-area network bandwidth.

"We're saving \$1,200 a month at our headquarters site by not having to buy a second T1 access line to our [Internet service provider]," said Randy Jackson, technology director at Sun-Health, in Sun City, Ariz. "Caching will enable us to get by with a single T1 for about two more years."

That benefit is unexpected to many.

"Users who buy proxy servers with the idea of shortening response times on Web page requests are just now starting to

find that reduces traffic on the Internet and on intranets," said Daniel Briere, president of Tele-Direct, Inc., a Verona, N.J., consultancy. "That benefit comes as a pleasant surprise."

Jackson agreed. Bandwidth conservation "is a bell and whistle that we didn't buy the proxy server for. But it's definitely something that IS managers should look into. I've been talking this up at user groups and with chief information officers," he said.

Sheryl Olguin, network manager at defense contractor Harris Corp., in Melbourne, Fla., said companies planning new links to the Internet should consider World Wide Web caching technology.

"Web caching is something IS managers should take a good

Caching, page 48

### • Targets small and home businesses

## Office store site goes public

By Sharon Machlis

AFTER DECIDING THAT its private World Wide Web site for large corporate customers was a success, \$6.7 billion Office Depot, Inc. this month launched a public version that targets small and at-home businesses.

The new site ties a Web front end with the company's inventory and ordering systems and conducts real-time warehouse checks to ensure stock is available nearby. The site, at [www.officedepot.com](http://www.officedepot.com), also verifies addresses and credit cards on the fly.

"What they've created seems to be a highly integrated site, [leveraging] their brick-and-mortar and sales delivery systems," said Gregory West, research director at The Yankee Group, in Boston.

Office Depot, in Delray

Beach, Fla., now discloses how much it is spending on its new Internet storefront. But savings could be substantial if customers move online: Processing an electronic order costs about 10% of the cost of a telephone



Office Depot stress-tested its site with corporate customers before offering it to consumers

order, said Paul Gaffney, senior vice president of systems development.

The new Web site is taking advantage of tens of millions of dollars the company has invested.

Office Depot, page 48

## FileNet puts browser access in document, workflow apps

By Barb Cole-Gornicki

**FILENET CORP.** recently rolled out the first in a new line of component-based workflow and document imaging tools.

FileNet's Patagon Integrated Document Management (IDM) Desktop was designed to access documents and images and route them using a Windows client or Web browser.

FileNet is playing catch-up with competitors such as PC Docs, Inc., in Burlington, Mass., and Documentum, Inc., in Pleasanton, Calif., which already provide World Wide Web hooks into their document repositories. But unlike some competitors' offerings, FileNet's IDM brings imaging and basic workflow capabilities to browser users.

### SIMPLIFY, STREAMLINE

The introduction of IDM Desktop is part of FileNet's broad push to reduce the number of products it sells and improve integration among them. The company has trimmed its product line from 300 to about 50 and will sell all its offerings under the

Patagon brand name. IDM Desktop, for example, includes what previously was sold as the Ensemble workflow product as well as Watermark imaging and FileNet document management software.

Mitchell Unmell, network imaging manager at the Kansas Department of Health and Environment, which has used FileNet products since 1989, said IDM Desktop could let the agency deploy document management to a broader audience. In the past, "we tended to build niche systems that addressed a particular business process," Unmell said. "What we really want to do is deploy [document management] across the agency."

Unmell may get his wish because the new Patagon IDM software will work with the agency's Lotus Notes messaging system in the next six months, according to FileNet officials.

Today, it supports Microsoft Corp.'s Exchange and Novell, Inc.'s GroupWise.

At a minimum, the reevaluation of FileNet's products should make it easier for users

to figure out which product is right for them, said Loreta Goralczyk, imaging manager at American Presidents Line Shipping Ltd., in Oakland, Calif. Goralczyk said in the past she found FileNet's wide range of products confusing.

### A LOT TO CHEW

The simpler product menu could help FileNet: It is the largest provider of workflow software but has had difficulty digesting several acquisitions in the past two years.

In October, FileNet posted a quarterly profit after three losing quarters.

While IDM Desktop could cut software distribution and training costs, FileNet has yet to introduce "one aggregated back-end server" in which to store documents and workflow maps for high- and low-end FileNet servers, according to David Yockelson, an analyst at Meta Group, Inc., in Stamford, Conn. Such a repository would further reduce the cost of ownership, he said.

Patagon IDM Desktop will also need work. It will cost \$300 to \$800 per user, O

## Caching cuts costs

CONTINUED FROM PAGE 47

look at because it's a key component of a mature Internet implementation," Olgun said. "It helps reduce traffic on these lines, which translates into bandwidth savings. Companies can delay adding new lines or eliminate the need for them altogether."

But users who access Web sites for constantly changing information may find that some proxy servers don't have the latest information cached, said Chris Nespor, senior systems administrator at Raytheon Services Co., in Landover, Md. "Some systems aren't good for information like stock quotes," he said.

Users also need to make sure that the proxy server they choose can store enough Web pages. Nespor said his system can scale to handle 24 G bytes of data, while others support less.

Microsoft Corp., Novell, Inc. and Netscape Communications Corp. offer software that turns an ordinary server into one that can support caching. Users can also buy stand-alone Web caching devices.

"Forty percent of our Web

page requests are handled using caching, which represents a lot of traffic that doesn't have to go out over a leased line," said Eric Send, webmaster and systems engineer at hobbyist publishing firm Krause Publications, Inc., in Iola, Wis. "Our proxy server has cached 19,649 files in what I call a fairly active cache."

WAN savings didn't come as a surprise to Send.

"We've been saving thousands of dollars a year on WAN

**"We're saving \$1,200 a month [with a proxy server]."**

— Randy Jackson, SunHealth

charges with caching," Send said. The company uses a 384 K bit/sec. line now and without caching would need double that bandwidth, he added.

But users shouldn't expect a proxy server to take the place of a second high-speed access line if the first is already heavily overloaded, Olgun said. "We had [thousands] of employees using the same T1 line, which became a bottleneck. We still needed more bandwidth." □

## Outsourcers use Web for EDI links

CONTINUED FROM PAGE 47

needs is a Web browser and an Internet connection.

The new system also is a real time-saver. Previously, a staffer typically needed 15 minutes to process one bill. Last week, one person processed 64 vouchers for Lucent's Things in less than two hours, according to Clipperton Vice President Sam Vanderbilt.

Affiliated Paper Cos. also set up a Web site to deal with smaller partners. But the Tuscaloosa, Ala., paper products supplier outsourced the EDI system that it needs to deal with large trading partners such as American Airlines. After losing its EDI coordinator, Affiliated Paper turned to DynamicWeb, rather than hiring another EDI specialist.

"We didn't want to risk losing another trained EDI coordinator," explained Byron Long, an Affiliated Paper senior programmer/analyst. Forms and stan-

dards are constantly changing, so an effective EDI coordinator is a vital link to trading partners. "As soon as you get someone, they're going to be pretty valuable to someone else," Long said.

**"It's not taking our time away from the important things we need to be doing." — Byron Long, Affiliated Paper**

DynamicWeb supplies the EDI software, maintains relationships with the value-added networks that provide mailbox services and performs document mapping and translation work. Changes are on a per-document basis.

"It's less than what it would cost to have an employee here

performing these EDI functions," Long said. "And it's more efficient in that it's not taking our time away from the important things we need to be doing."

Industry analysts expect that increasing numbers of companies will outsource EDI projects to companies such as DynamicWeb.

"People have had enough experience with the technology and with general areas of automation to understand the power of the new business process models," according to David Alschuler, an analyst at Boston-based Aberdeen Group, Inc.

"They don't want to do it in-house. It's not the business they're in," said Gen Spieler, a research analyst at Stamford, Conn.-based Gartner Group, Inc. "They don't have the technical expertise and infrastructure to maintain it." □

## Office Depot expands site

CONTINUED FROM PAGE 47

ed in its general corporate systems, he said. "It's an incremental investment," Gaffney said.

Issues of how to integrate a Web interface with the back end were hashed out the year before and a half ago when a private Web site was launched.

The site is using Internet Information Server and Commerce Server from Microsoft Corp., tied to a 12-processor AS/400 messaging and ordering system and an IBM mainframe center for delivery data. The company uses its own trucks and drivers for nationwide shipping.

### BETTER EQUIPPED

Office Depot outsourced the design of the site to Studio Verso, in San Francisco, after determining it didn't have the expertise to do the work in-house. Studio Verso developed the look, selected art elements and determined Web-specific issues such as how much information to put on

one page and how to make it easy for customers to find what they want.

The Web site allows users to find specific products by keyword or numbers as well as by browsing the catalog. It uses characters from the popular Dilbert comic strip to keep surfers interested.

### PAY IN FOCUS

Office Depot tested initial concepts with focus groups, said Beth VanStory, vice president of Office Depot Online, in San Francisco.

Although it may seem late to post a consumer Web site for business machines and office supplies, Vester said he believes Office Depot's marketing muscle carries enough weight to make up for the timing.

Office Depot said it is first in the fragmented office supply market, with about a 4% share. "There's no such thing as being late when you're carrying a big brand name," Vester said. □







FROM THE EDITORS OF

# COMPUTERWORLD

VOLUME 3 NUMBER 1

JANUARY 26, 1998

# Intranets

A MONTHLY LOOK AT WEB DEVELOPMENTS BEHIND THE FIREWALL

KNOWLEDGE MANAGEMENT

## Getting to 'Aha!'

Companies use intranets to turn information  
and experience into knowledge — and gain

a competitive edge / By Sharon Johnson



**L**ike most employees new to a company, when Andrew Jewell needed to answer an important question about a department project, he wasn't quite sure where to turn. So Jewell, a configuration management manager in the industrial and utilities consulting group at American Management Systems, Inc., logged on to AMS's "Knowledge Center." The center is AMS's Notes 4.5/Domino server-based knowledge management intranet, an online compendium of the Fairfax, Va.-based consulting firm's best practices.

From Notes, Jewell reviewed the center's white papers on business process re-engineering tools but still didn't find the information he needed. He then clicked on a directory listing AMS's residence

on a vice

## KNOWLEDGE MANAGEMENT

*Continued from page 1*  
the fall who was happy to share his expertise.

"The Knowledge Center gave me a single point of contact to check all the resources of the firm," Jewell says. "Without it, I'd probably have wound up re-inventing the wheel."

That notion of putting the combined knowledge of the firm at an employee's

fingertips is the essence of knowledge management. The basic goal is to take key pieces of data from various sources, such as groupware, databases, applications and people's minds, and make them readily available to users in an organized, logical form that represents knowledge.

The ability to pull together facts and personal experience into knowledge others can then share has eluded many businesses. Of 400 executives surveyed last year by Ernst & Young's Center for Business Innovation, most said theirs was a knowledge-intensive business, but 87% said their firms were only average or worse at transferring knowledge. "It's hard to know what we know collectively," says Susan Hanley, director of the Knowledge Center and senior principal at AMS.

But intranets and browser-based search, retrieval and display tools are changing that by making it possible to extract knowledge from a range of sources, including white papers, sales presentations, online forum threads and employee directories. More than 51% of the executives in the Ernst & Young survey said intranets will be the most

important tool in building corporate knowledge, and 72% are already either building or planning to build intranets. Users *Computerworld* interviewed said that with robust means in place, building knowledge management systems becomes a process of identifying key data to capture; organizing and maintaining it, and then helping users search it with Web-based tools.

So far, intranet-based knowledge management systems are most prevalent at consulting firms and organizations such as sales, where knowledge is fairly homogeneous and the systems therefore easier to implement, observers say. But deployment is growing quickly. "Knowledge management is growing as fast [as] or even faster than the Web-based phenomenon," says Thomas Koulopoulos, president of Delphi Consulting Group.

Nonetheless, even with solid intranet foundations, knowledge management challenges are considerable. There's adapting groupware tools such as Notes for enterprise-wide support; supplying robust, intuitive data retrieval tools; persuading employees to participate in knowledge management programs; and quantifying benefits. Hewlett-Packard Co. is one firm that's been able to calculate annual savings: \$25 million in the U.S. alone from its Electronic Sales Partner program. But most other companies have found it tougher to affix dollar figures to their efforts, which can cost up to \$7,500 per employee.

### GATHERING KNOWLEDGE

For many users, consultants said, the starting point for knowledge management applications is recognizing a specific business problem, such as timely distribution of literature to salespeople, or sensing that better communication of ideas is needed across the company to maintain or build a competitive edge.

Concentrating on solutions for a single line of business or a select group of users will simply lead to additional islands of information management rather than a continuum of knowledge management,

says Jim Barr, research director and head of knowledge management research topics at Gartner Group, Inc. But other consultants say companies with heterogeneous lines of business or employee functions might find attempting enterprise-wide knowledge management to be overkill. "You don't want knowledge management to become the arterial plaque on the walls of your network," Koulopoulos says.

For example, while AMS has several consulting specialties, it decided all consultants could benefit from access to best practices data. Realizing that most of these practices were locked in the minds of thousands of employees scattered across the globe, AMS created a Knowledge Center. Associates program designed to encourage consultants to commit to work on at least one best practices project a year. Associates may work singly or in virtual groups to create white papers distilling these practices.

Senior consultants review the papers to ensure they don't conflict with other best practices. Next, they're indexed by the Knowledge Center's staffers, who enter them into a Notes database for retrieval. Consultants in the company access the center via a Notes interface. Outside the company, they can search Web-enabled Notes databases through the Domino Web server.

AMS began its knowledge programs with one "core competency" in 1993 and expanded it to five others in 1995. In 1996, about 250 associates completed research projects; that number grew to 450 in 1997. Hanley says. With thousands of consultants in 50 offices worldwide and new knowledge being created constantly, the process of capturing it will be a continual one, she says.

HP, which has several knowledge management initiatives under way, illustrates the "point of pain" approach. The need for its Electronic Sales Partner intranet was clear. "Our fundamental issue was how to build an electronic system that thinks the way the user does and reduces

*Continued on page 6*

### THE FACTS

**Top 3 things to know:**  
Knowledge about customers (87%)

**Best practices/Effective processes (87%)**  
Own competencies and capabilities (86%)

**Biggest impediment to knowledge transfer:**  
Corporate culture (54%)

**Biggest difficulties in managing knowledge:**  
Changing people's behavior (58%)

**Who's leading knowledge management initiatives?**  
IT is in front with 12%, followed by senior management at 8%

**Intranets and knowledge management:**  
47% are building intranets;  
25% have built them;  
1% say they should build them

Source: Ernst & Young Center for Business Innovation and its 1997 survey, "Executive Perspectives on Knowledge in the Corporation"

## Blazing New Mail Trails

**T**he Chancellor's Communications Services (CCS) office at the University of California at Los Angeles receives on many as a hundred letters a day — correspondence on budget questions, student fees, campus facilities and academic issues. Twice a day, five people open the letters, read them, type summaries into a miniterminal and then manually route and later follow up on the letters to see if proper action was taken.

That's all set to change as the office pilots a new knowledge management system based on RetrievalWare 4.0 from Envision Technologies Corp. in Vienna, Va.

Under the new system, staffers will scan and index incoming letters for

routing to the appropriate individual. Then recipients logging on to their campus Web browsers will see lists of mail divided into "notes" and "TV" items, each tagged with the date of receipt, author and a content abstract. Clicking on these will take users to a Web file, where they can cut and paste the contents and record actions taken on an annotation tab. Whatever they do, they can't leave the document until they've taken some action, says Greg Partillo, project leader in UCLA's administrative information systems (AIS) area.

While this may seem like a familiar document management solution, Partillo and his boss, Jackie Reynolds, say it's much more. "We needed the ability to search on anything," says Reynolds, manager of information systems support for AIS. Document management tools reviewed did not offer RetrievalWare's adaptive pattern recognition or fuzzy search logic, Partillo says.

Analysis also say not to discount knowledge management at the document level. "Knowledge management is about creating unanticipated connections between information," says Thomas Katsipos, president of Delphi Consulting Group. He says many of these potential connections get lost in documents because they tend to be so unstructured.

To bring order to the CCS documents, Envision worked closely with Partillo's team to provide a system that includes Kinetix, Inc.'s Acrobat Capture optical char-

acter recognition, scanning and indexing software, Partillo says. CCS staffers scan letters using Acrobat on a Dell Computer Corp. GX 266-MHz workstation tied to a Fujitsu 300V document.

Next, at total Corp. Postnote-class workstations equipped with Acrobat and 21-in. monitors, CCS staffers index the documents using pull-down menus that Envision custom-scripted. When finished, the Acrobat server releases the indexing data to a SAS Server database and the Web images to a Compaq Computer Corp. ProLiant 2800 server with a 100-byte hard drive.

RetrievalWare creates and routes letter abstracts to users. Staffers can also set electronic-mail triggers on urgent documents, and RetrievalWare will send the recipient the document abstract, as well as a hyperlink to the Web login page. When searching for a document, users may either refer to index data or to some words or phrases in the letter. RetrievalWare either matches the query against the SAS database or services text.

The CCS project was necessary because CCS users were overwhelmed to have their miniterminals mail support at year-end 1997 but needed information to deal with thousands of letters a month, Reynolds says. UCLA's Student Affairs is piloting a RetrievalWare indexing project, and Partillo says he could use the software becoming the search engine of choice for the campus. But Reynolds says that while other UCLA departments have been impressed by the CCS project's features, they are holding off on costs, which neither she nor Partillo would share.

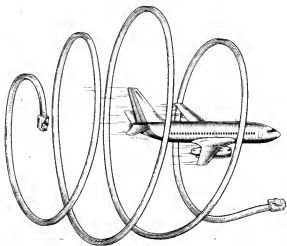
But Partillo says adopting a newer technology may not be cheaper in the short term than the manual processes it replaces. "But if you're on enterprise that wants to automate on the desktop, sometimes it's more expedient to implement that automation," he says.

— SHARON WATSON

**"WE NEEDED the ability to search on anything."**

**JACKIE REYNOLDS,  
MANAGER OF IS SUPPORT,  
UCLA**





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## Novell.

## KNOWLEDGE MANAGEMENT

*Continued from page 2*

the time to get documents that solve customer business problems," says Bob Crum, knowledge manager, sales communications, at the Palo Alto, Calif.-based computer maker.

The company was wasting thousands of dollars printing sales literature that was never delivered and was eventually destroyed, Crum says. Yet the international sales force couldn't easily retrieve required documents. So in February 1995, the company rolled out the Electronic Sales Partner program, a repository of 30,000 sales-related documents accessible via Netscape Communications Corp.'s Navigator over the company's intranet from 110,000 PCs. "It's become mission-critical as far as the sales force is concerned," Crum says. "We deliver a document every 1.5 seconds to a salesperson somewhere in the world."

### RETRIEVAL IS NEXT

Yet creating a repository of knowledge, whether it's white papers or sales collateral, is only the beginning of knowledge management. Enabling people to search it is the next ball of wax.

HP organized its documents into 11 folders. 73% of the time users search (rather than browse) them to find the data they require, Crum says. But the increasing use of search tools—in this case, a several-year-old version of Verity, Inc.'s Verity Topics and a front end customized in Perl—creates its own issues, he says.

"Full text and metadata searching are not sufficient any longer," Crum says. A query on "real banking solutions" might bring up thousands of documents or none. And a "zero" response might mean no actual data is available—or just reflect an imprecise user query. "Over the coming year, we need to radically alter our searching scenario to bring up more relevant documents," Crum says.

To do that, the company will upgrade to a newer version of Verity's search engine and is evaluating push and agent technologies. It won't be alone, consul-

## Tips For Know-How

**1. ADD TRAINED LINGUISTS** to your knowledge management system to streamline the information organization, or "taxonomy," process.

**2. TAKE A LONG GIVE:** Users say the right knowledge management programs can help reduce Internet network traffic by replacing general out-going services and long search sessions.

**3. KEEP IT SIMPLE:** Make it easy for users to categorize their knowledge submissions with pull-down menus.

**4. ADD SOME EXTENS:** Select users into your knowledge management system by giving them features such as access to restaurant guides or chat rooms.

**5. FACTOR IN OUTSIDE RESOURCES:** Include commercial databases and subscription services, such as Dow Jones and Reuters, in indexing and searching strategies.

**6. FINISH USING TO ENHANCE JOURNALS:** Multitasked knowledge—both outside sources or in-confirmed responses to a question—may be pearls or slow-moving potholes.

**7. MANAGE ARCHIVES:** Collect various articles and tabulate hit rates on specific documents to encourage program participation and demonstrate success to management.

**8. THINK MAINTENANCE:** Have a plan for updating or dropping obsolete knowledge.

ants say. The information retrieval tools market is bursting with new entrants as well as old hands that have redressed document management and search engines in knowledge management clothes (see box, page 10).

These tools, which include offerings from market leaders Dataware, Ecalibur, Fulcrum and Verity, all accomplish the same basic tasks: They create metadata, or information describing data; they index data residing in a variety of applications; and they enable users to search the data using search engines similar to those on the Internet. All vendors tout their ability to make the underlying location of the data transparent to the user.

But the data sources may be problematic. For instance, AMS considered using Verity to search its Notes databases, but it was too hard to pull metadata from Notes databases using such tools, Hanley says. Consultant Bair says that's not surprising because Notes is a flat file rather than a robust relational database; however, he expects upcoming versions of Notes to be more compatible with knowledge management search tools.

Not all users are adopting these tools, though. At Buckman Labs in Memphis, users of the K Netix knowledge management intranet find Netscape Communicator's search abilities sufficient, says Tim Meek, manager of knowledge transfer at the chemical manufacturer.

AT&T is building its own retrieval tool for its knowledge management intranet, says Joe Barrera, intranet program manager for the telecommunications carrier. Because AT&T is filing for a patent on its search tool, he could not describe it in detail. But Barrera did say it will encompass Verity, which searches and catalogs AT&T's many internal web sites, and also search databases, applications and employee directories—features Verity didn't have when AT&T was planning its system.

Several consultants agree that even the most effective search engine simply retrieves information and that it's up to the user to connect the dots to create



knowledge from that data. Some users say they'll be investigating so-called visualization tools to automate this process. Such tools sit on top of traditional retrieval tools and present hits to users in some visual format, such as by clustering hits closest to the user's query. Eventually, with artificial intelligence or fuzzy logic, similar tools might even suggest to users related topics they might want to review, Kouloupoulos says.

#### GETTING USERS TO USE IT

No matter how sophisticated knowledge management tools become, users say, they're all for naught if users ignore them. And ignore them they will if they are too difficult to use, consultants say. "The more you make the user do, the more restricted the flow of data will be," says Rob Boblin, chief operating officer at Lexington, Mass.-based Nexterra, a knowledge management consulting firm.

To encourage users to submit knowledge, AMS offers a special conference with name speakers such as Tom Davenport, author and information technology management guru at the University of Texas, for its Knowledge Center Associates. At Buckman Labs, where KNetix actually began as a series of private forums on CompuServe, online break rooms the company created to keep nonbusiness chatter outside of the forums actually helped increase user participation, Meek says. "The rooms helped employees get to know each other and built trust among them," he says. To more easily capture and search forum threads, the company plans to transfer them to its intranet in the coming year.

On the information retrieval side, ensuring quality of information has been key to the success of HP's Electronic Sales Partner program. "We pay absolutely meticulous attention to our user's needs," Crum says. He has rejec-

*Continued on page 10*

## Meeting Knowledge Head-On

**C**reating an annual management presentation used to require engineers to make three trips or more to Texas Instruments, Inc.'s Dallas headquarters.

"People would take notes, create action items, go away and work, then come together again to get comments," says Marshall Woolard, virtual teams program manager.

But that meeting style is changing. For the most recent presentation, Woolard's team worked in an intelligent conference room now in testing at TI. Equipped with two interactive whiteboards, a projector, a hybrid workstation and a server, all using TI-developed technology licensed to Smart Technologies, Inc. in Calgary, Alberta, the room linked far-flung participants via the company's intranet.

Participants write on the whiteboards, whose contents can be stored on disk. They can also see applications on their laptops. The data is transmitted to TI's network and the

conference room server for whiteboard display using Microsoft Corp.'s NetWeb wireless LAN. Experts from other regions are linked in via Microsoft's NetMeeting.

The result: Real work gets done at the meeting.

"Capturing this kind of knowledge as people are co-creating it is the next step for knowledge management," says Cindy Johnson, director of collaboration and knowledge sharing at TI.

Woolard explains that one person might start out making changes to a design while others watch on the whiteboard. Then, as a person "catalyzes on" to the first engineer's direction, he adds to the diagram. "It becomes a very natural, interactive flow," he says.

Woolard notes that interactive meetings require strong management support because some people resist changing meeting formats. In general, though, they accomplish more and better-quality work than at traditional meetings, he says. "It's impossible to quantify time saved because when you have a successful [interactive] meeting, you don't know how many other meetings you would have needed had it not gone well," he says.

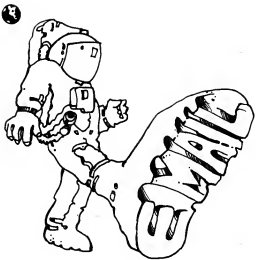
In addition, the possibilities are great. "There's just a tremendous wealth of knowledge that can be capitalized on," he says.

— SHARON WATSON

**"CAPTURING THIS kind of knowledge as people are co-creating it is the next step."**

CINDY JOHNSON, TI





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\*1997 CNA research evaluation of Houdi GroupWise, Lotus Notes, and Microsoft Exchange.

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## KNOWLEDGE MANAGEMENT

Continued from page 7

ed submissions that are not germane to the international sales force, such as a link on an internal web site to San Francisco-area organizations.

What's proving more difficult than persuading users to participate in knowledge management is calculating its hard-dollar benefit to the enterprise, users say. Knowledge management isn't cheap. Meek says Buckman Labs has kept the cost at about \$7,500 per user annually. A spokesperson for Fulcrum says per-user fees may range from \$50 to \$400 per user, depending on the configuration licensed. Staffing needs can be substantial, too. Eleven employees are dedicated to supporting HP's Electronic Sales Partner. AMS has 90 people who spend at least some time on the Knowledge Center.

And knowledge management payoffs can be hard to quantify. HP is the exception, with its \$25 million annual savings from the sales partner program calculated on the assumption that salespeople have two to five more hours a week to sell, Crum says.

AMS signed up one new client only after consultants pulled up 15 real-world examples from the Knowledge Center that convinced it that AMS had the expertise. Hasley says, Buckman Labs has seen its percentage of revenue from new products steadily increase in the past five years, but Meeks says it's difficult to pinpoint how much of that is related to knowledge management.

But even if hard or soft dollar savings are hard to tally, its proponents say knowledge management is inevitable. "You must give people the technology to manage information more easily, then explain why it won't really get easier," says John Preter, chief knowledge officer at Ernst & Young. "We've arrived at the 21st century, and the volume of information will only grow. We must help employees cope."

Wislon is a freelance writer in Chicago.

## Product Sampler

Some vendors that offer knowledge management tools for the intranet

For more details, visit us online at [www.computerworld.com/intranets](http://www.computerworld.com/intranets)

### Altris Software, Inc.

[www.altris.com](http://www.altris.com)

**Web Information Server and Distributed Object Metre 4** enables access to document management systems in the enterprise.

### KnowledgeX, Inc.

[www.knowledgex.com](http://www.knowledgex.com)

**KnowledgeX** is software for acquiring, discovering, publishing and distributing knowledge.

### Megafile, Inc.

[www.megafile.com](http://www.megafile.com)

**Megafile Server 1.0** enables indexing, locating and retrieving data across all media types. Works with existing infrastructures to retrieve content on the Internet or intranet.

### BackWeb Technologies

[www.backweb.com](http://www.backweb.com)

**BackWeb InfoCenter 4.5** lets companies quickly create customized knowledge distribution systems for intranet and extranet applications.

This view of Fulcrum's Knowledge Map function captures the variety of information assets a business can draw on to create knowledge and illustrates the complexity of creating a taxonomy or organizational data structure.



### Fulcrum Technologies, Inc.

[www.fulcrum.com](http://www.fulcrum.com)

**Product line includes WebCD, Knowledge Network and the SearchServer family.**

### Inference Corp.

[www.inference.com](http://www.inference.com)

**Product line includes Inference Find, knowledge search and clustering tool and the Intranet Help Desk Knowledge Management Solution.**

### Intraspect Software

[www.intraspect.com](http://www.intraspect.com)

**Intraspect Knowledge Management System** features collaboration, search and retrieval, groupware and database technologies.

### Molloy Group, Inc.

[www.molloy.com](http://www.molloy.com)

**Intranet Knowledge Kiosk** is for help desks and call centers.

### Pyntap Corp.

(512) 887-0875

**EKASYS** provides value-priced knowledge management and competitive intelligence solutions.

### Verity, Inc.

[www.verity.com](http://www.verity.com)

Data in documents can be searched, extracted, indexed and rendered in HTML for viewing via Web browsers.

## PROJECT: PEOPLESOFT, INC.

# Knowledge Bases Raise End-User IQ

By Steve Alexander

**T**o accommodate rapid growth, PeopleSoft, Inc. developed an intranet for company-wide technical support. As the firm grew from about 1,500 employees in November 1995 to 4,200 at the end of 1997, it began using knowledge management software to allow employees to diagnose their own problems and help train new help desk employees more quickly, says Tracy Leighton, manager of PeopleSoft's knowledge development team in Pleasanton, Calif. The application, called Eureka, christened the company's intranet.

### WHAT THEY'RE DOING

The intranet-based system comprises software that asks users questions until they arrive at an answer to their problem. It's built on case bases, about 1,700 of which are prepackaged cases concerning Windows 95 and NT. PeopleSoft built about 2,500 more cases from interviews with technical staffers and from unresolved cases.

Besides technical help, the system also provides telecom data, sales force enterprise application data and a guide that explains the network to employees.

### WHY CALL IT KNOWLEDGE MANAGEMENT?

Information management puts bits of information in order so they can be searched. Knowledge management identifies key pieces of information and lets people find that information through a question and answer sequence called a problem solution set.

### USAGE

The first month, there were fewer than 600 user sessions. Promotion efforts, which included putting a Eureka icon on all desktop PCs and offering orientation programs, increased user sessions to 3,500 a month by November 1997. However, employees still can — and do — call the help desk, which in fact has experienced an increase in calls. Leighton attributes that to the company's transition to Windows NT 4.0 and Windows 95 and notes that users' problems are more sophisticated, such as "I can't get my IP address."

### STAFFING

When we started working with our help desk in November 1995, it had less than six people, and we had 1,500 to 1,700 employees. We now have

4,200 employees and about two dozen help desk people, including the first-level call

center and the second-level LAN support that calls escalate to.

### PRODUCTS

Inference Corp.

PeopleSoft's Tracy Leighton

"I don't have to know what I'm looking for at the beginning of the session, that's knowledge management."

provided the structure for authoring the knowledge bases. PeopleSoft used Inference's case-based reasoning technology, CasePoint WebServer and prepackaged knowledge bases for Windows NT 4.0 and Windows 95.

PeopleSoft modifications of the Web server included the Eureka front end and a call-tracking application for the help desk.

### COST SAVINGS

PeopleSoft hasn't calculated total cost savings but estimates that the help desk gets 50% to 60% fewer calls than it would otherwise.

### GREATEST DIFFICULTY

First getting higher management buy-in, then getting people to share knowledge and finally letting people know the system was there.

### ADVICE

Develop a business plan to make justification easier as the project advances. Have a vision to avoid a disappointing user response.

### LOOKING AHEAD

In 1998, PeopleSoft will consider adding knowledge management "case bases" for human resources or for a combination of the help desk, network support staff, server support staff and database administrators.

Alexander is a freelance writer in Edina, Minn.

### WHAT'S ONLINE

For the full interview with Tracy Leighton and RealAudio clips, visit [www.computerworld.com/intranets](http://www.computerworld.com/intranets)



**COMPUTERWORLD INTRANETS** is published monthly on the fourth Monday of the month as a supplement to *Computerworld*. Editor: Anne McCrory; Designer: Mary Beth Welch; Assistant Managing Editor: Kimberley A. Smith; Computerworld Magazine Editor: Alan Alper; Phone: (800) 343-6474; E-mail: [anne\\_mccrory@cw.com](mailto:anne_mccrory@cw.com); fax: (508) 875-8931.

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# The Enterprise Network

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## Briefs

### BAD NEIGHBORHOOD

How many times was your network successfully hacked in the past year?

42%  
58%

Note: 73% of responding businesses said they feel the necessary security equipment to detect internal and external network hacking attempts

Base: 205 Fortune 1,000 businesses

Source: Network Research LLC, McLean, Va.

### Fast LAN switch

At ComNet '98 this week in Washington, OGS Networks, in Richardson, Texas, will announce the LANBuilder 7000, a seven-slot LAN switch that can support 24 Gigabit Ethernet ports or 24 Fast Ethernet ports. The LANBuilder 7000 delivers more than 49G bps/sec. of bandwidth. It can be configured to support two Gigabit Ethernet ports or 192,270. It is shipping now.

### IP-based routing

Berkeley Networks, Inc., in San Jose, Calif., recently released its new network switch for the first time integrating the Windows NT operating system with a high-performance intelligent switch.

The new expansion-integrated-network switches use Windows NT—including Microsoft Corp.'s routing and remote access services—to give businesses an "application-aware" switch platform. The switches can process up to 70 million packets/sec. and deliver up to 49G bps/sec. of full-duplex network I/O capacity, according to company officials.

Berkeley Networks' first two products were the EX, an enterprise backbone switch that has 48 Gigabit Ethernet ports or 384 Fast Ethernet ports; and the SX attachable switch, which can be configured with 24 Gigabit Ethernet ports or 192 Fast Ethernet ports.

## Telco fees raising a buzz

### ► New AT&T, MCI charges to meet federal rules

By Matt Hamblen

AT&T CORP. and MCI Communications Corp. this year are adding two controversial fees to the bills of some of their business customers to help comply with federal mandates.

Money from one fee will go to pay off AT&T's and MCI's portion of the \$700 million that

### LONG-DISTANCE CARRIERS

carriers must pay into the federal Universal Service Fund (USF). That money will be used to give schools and libraries Internet access. The fee will total between 4.4% and 4.9% of a customer's bill.

The other fee, a new Presubscribed Interchange Carrier Charge (PICC), is one that all long-distance carriers must pay

local carriers. The fee is \$0.75 per line for small to midsize customers who use multiple copper lines, but it doesn't apply to nodal services such as the T1 connection used in larger businesses.

"I am a Democrat, so in that sense it's fair to collect [the USF fee]. But if I put on my corporate hat, I'd say it's not fair," said

Bach Nguyen, director of global network systems at Franklin Resources, Inc., in San Mateo, Calif. "From a business perspective, do we as a business have an obligation to make sure libraries in rural areas are taken care of? I don't think so."

Nguyen recently signed a contract with AT&T for "millions of dollars" per year for

voice and data services for 20 offices globally that have 6,000 users. Franklin isn't paying the USF fee because AT&T hasn't applied it to its largest contract customers. But the carrier is automatically levying the amount against many midsize and large

Telco fees, page 50

### MANAGEMENT

## Automated service diagnoses nets

By Patrick Dryden

THROUGH AUTOMATION, a small consultancy hopes to extend its network failure prediction service to more information systems managers.

Like 15 managers, NetOps Corp. has a tough time finding and keeping experts who can turn arcane network statistics into meaningful information. So the Pleasantville, N.Y.-based firm built an analysis engine, which is available this week, to diagnose networks remotely.

### EASIER ANALYSIS

"This way we don't have to hire experienced network engineers in all five regions to prevent problems," said beta-tester Steve Surdian, a senior network analyst at cable television provider Mediaset, in Boston. The new service, Do It Yourself, starts with free monitoring software to gather statistics from standard management agents within internetworking devices. It can model the traffic patterns and prepare the data for analysis.

To check a network's health, the subscriber uploads selected

Automated service, page 50

## Lotusphere priority: Manage Notes

### ► Tools grapple with groupware, virus scanning

By Barb Cole-Cornelini

ADD-ON PRODUCTS being rolled out at Lotusphere '98 this week focus on making Lotus Development Corp.'s Notes easier to use for big companies.

With more than 15 million

users, Notes is now the most popular electronic-mail platform, according to "Electronic Mail and Messaging Systems," a newsletter in Washington.

And the size of the average Notes network is growing because most activity is taking

place in enterprise sales to large companies, said Tom Austin, an analyst at Gartner Group, Inc., in Stamford, Conn.

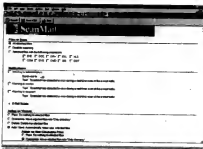
At Lotusphere, in Orlando, Fla., this week, a slate of companies plan to announce products that shore up Notes in key areas, including systems management and virus scanning. In addition, ready-made applications—which let companies more quickly use the groupware features of Notes—are on tap from several companies.

### GROWTH SPURT

As in many companies, the Notes user base at Rancho Industries, a car parts manufacturer in Long Beach, Calif., has quadrupled in the past year.

According to Von Arprian, MIS coordinator at Rancho, a larger Notes installation could mean a greater reliance on third-party products. "Right now, we're really just using Notes for E-mail," Arprian

Notesphere, page 50



TrendMicro's ScanMail 1.5 has a Web-based client that lets systems administrators remotely manage Domino servers

## Lotusphere products

CONTINUED FROM PAGE 49

said. But as Notes applications are added, performance monitoring becomes more important, he said.

Candle Corp., in Santa Monica, Calif., will announce a Notes diagnostic tool called Intelwatch Tracer and a performance monitoring tool called Pinnacle. Systems management has long been a stumbling block for large Notes sites because the messaging system has limited built-in management capabilities. Also on the systems management front, Phoenix-based

supports Windows NT, Solaris, OS/2 and AIX. ScanMail 1.5 also has a new World Wide Web-based client that lets systems administrators remotely manage Domino servers.

### FOCUS ON RENTABLES

Rentable Notes applications will be in the spotlight at Lotusphere. Houston-based Interlink, Inc. will announce Interlink On-Sight, an interface to the company's Domino hosting services with new database management capabilities, detailed usage reporting and customized trouble alerts.

Phil Usher, first vice president of messaging at Countrywide Home Loans, in Calabasas, Calif., said rentable Notes applications have appeal, but he is concerned that rentable applications won't scale. Pricing is also an issue because most rentable applications carry a per-month/per user fee. Usher said, "The price model may work for a small company, but not when you have thousands of [employees]," he said.

For those looking for pre-built software for Domino, Infusum Software, Inc., in Hyattsville, Mass., will announce a suite of applications for Domino servers that run on IBM AS/400s. The applications include performance review management, invoice resolution, purchasing approval processing and order processing. □

## Automated service

CONTINUED FROM PAGE 49

data to NetOps. It costs \$500, plus \$10 per device, to examine a week's worth of statistics. A rules-based analysis server detects and compares minute changes in router utilization and memory usage, for example, then pinpoints the most cause and recommends steps to prevent service loss.

"Within an hour, I get a e-mailed report via E-mail revealing problems ranging from cabling through router performance," Sundram said. Other tools and services can interpret network data to reveal performance trends, but NetOps is unique in its specialization on

failure prediction, said Ellen Carney, a management analyst at Dataquest, in San Jose, Calif.

"This service supplements existing tools and expertise and is cheap enough that users don't have to go far up the food chain to get approval," Carney said.

Thus pay-as-you-go option costs what NetOps charges for its custom analysis service and delivers reports immediately instead of weekly. But NetOps can't yet offer direct interaction with its back-end analysis engine from a browser via the World Wide Web. Distributed monitor software is available at [www.netops.com](http://www.netops.com). □

## Telco fees ring in

CONTINUED FROM PAGE 49

business accounts, an AT&T spokesman said.

The PCCC charge also doesn't apply to Franklin but will be paid by AT&T's business customers — mainly smaller ones that have multiple copper lines but not T1 or other modal connections.

AT&T officials said most large customers already

### LONG-DISTANCE CARRIERS

have written contracts that specifically forbid additions such as the USF charge, but some don't. Gartner Group, Inc., a consultancy in Stamford, Conn., is urging its clients to negotiate such fees out of new contracts and to contact their corporate attorneys to see if state contract laws can prevent the fees from being included in bills under existing contracts.

"I think raising the money is a carrier's problem," Nguyen

said. "We don't have to subsidize electricity, so why should we subsidize telecom? I understand the spirit of it but don't think it's right."

In fact, the carriers aren't required by federal regulators to pass the new fees on to customers, although the federal

Communications Commission has required that the

PCCC payment be made to local carriers and that long-distance carriers pay the USF.

### TRUTH IN ADVERTISING

Another AT&T customer said it was good that the carrier is announcing the fee and showing it as an item on bills rather than hiding it in higher overall prices. "Is it fair? If the long-distance carriers are required to pay into this fund, then it's fair," said David Brown, infor-

mation technology director at McLaren/Hart Engineering Group in Rancho Cordova, Calif. "One way or another, it's going to show up on a bill. It's more fair to show it rather than bury it. A tax is a tax, so call it what it is."

Erik Psoulak, an analyst at Gartner, said customers should n't be paying the new fees, especially because the long-distance carriers have won savings for access charges paid to local carriers that the consultancy estimates at \$45 billion over the next five years. He recommended that users who are charged seek a new carrier.

Aside from AT&T and MCI, other long-distance carriers, including Sprint Corp., in Kansas City, Mo., haven't announced their plans for how they will raise funds to pay the new federally mandated fees. □

## Intel takes aim at networking ease of use for small companies

By Nancy Weil

INTEL CORP. is shipping nine new networking products, aimed at businesses with fewer than 50 employees.

The Business line, which started shipping this month, sprang in part from Intel's acquisition four months ago of Dayna Communications, Inc., which built network products for small businesses, according to Intel officials.

Pricing for the product line ranges from \$79 to \$909. It

was designed to let small companies connect PCs to LANs for less than \$2,000. Products include three 10-Mbit/sec. Ethernet hubs, three 100-Mbit/sec. Fast Ethernet hubs, two Ethernet switches and an Internet Station — a software package meant to let multiple users access the Internet using one Internet service provider account.

The products were designed to be easy for users to install and maintain without technical support, which is scarce or nonexistent in small businesses.

Intel has steadily made inroads into the networking market, which the chip giant entered in 1990, said John Armstrong, principal networking analyst at Dataquest, in San Jose, Calif.

Armstrong said half of the world's workforce is in small businesses, so the market has growth potential for Intel.

"There are other small office solutions available from people like Bay Networks," he said. □

Weil writes for the IDG News Service in Boston.

## International E-commerce standards urged

By Elinor Mills  
SAN FRANCISCO

INTERNATIONAL LAW may impede electronic commerce more than technical questions, experts said at the RSA Data Security Conference here last week. The conference was sponsored by RSA Data Security, Inc.

"If electronic commerce is to fulfill its potential, there must be greater commitment toward standards [for authentication]," said Adrian Liela, a partner in the London-based law firm of

Osborne Clarke.

In England, for example, the legality of digital signatures is in question, according to Liela. In France, digital signatures appear to be legitimate, but the government insists on keeping encryption keys in escrow so it can open documents it wishes to read, said Alexander Blumenson, a partner at the Paris law firm of Bernard-Henri-Beijer.

The European Commission wants to unify the landscape but won't hold hearings on the matter until later this year, said

Robert Bond, a partner at the London law firm of Hobson, Audley, Hepkins & Wood.

U.S. policymakers are debating the issue, but the export or international use of strong encryption is currently forbidden.

In Singapore, meanwhile, anyone can use encryption, and there are no key recovery requirements, said Wilson Wong of Singapore's Allen & Gledhill law firm. □

Mills writes for the IDG News Service from San Francisco.



## NEW PRODUCTS

**PACKETEER, INC.** has announced PacketShaper 3.0, software for bandwidth management.

According to the Campbell, Calif., company, the software now comes as a standard feature on all three of the company's PacketShaper bandwidth management tools.

It identifies all inbound and outbound traffic types on enterprise wide-area networks and suggests service-level policies to relieve traffic delays. IP class of service control and year 2000 compliance also are included.

The PacketShaper 2000 for T1 speed connections costs \$7,250. PacketShaper 4000 for T3 links costs \$14,500. PacketShaper 1000, which handles speeds up to 384K bit/sec., costs \$5,450.

**Packeteer**  
(408) 364-0197  
www.packeteer.com

**MEMOTEC COMMUNICATIONS, INC.** has announced four I/O hardware cards that fit into the company's CX900/900E remote access switches.

According to the Montreal company, the 100BaseT Fast Ethernet module provides increased speed for mounting access. The T1/E1 channel service unit/data service unit module supports 56K bit/sec. and 1.55M bit/sec. speeds.

The Integrated Services Digital Network S/T module is aimed at the European market, and the Multi-Port I/O module gives the six slot CX900E up to 35 serial ports.

Pricing ranges from \$695 to \$1,595.

**Memotec Communications**  
(514) 738-4781  
www.memotec.com

**FUNK SOFTWARE, INC.** has announced Steel-Belted RADIUS 1.5, a remote authentication dial-in user service (RADIUS) server with tunneling and virtual private network (VPN) support.

According to the Cambridge, Mass., company, the new server lets network managers centralize the setup and maintenance of VPNs or tunnels, which guarantee bandwidth and security to users.

It has an enhanced proxy RADIUS capability that lets remote users dial in to networks using standard log-in names and passwords without appending suffixes indicating proxy RADIUS targets.

Support for token-based authentication also is included.

The server costs \$4,000 per copy.

**Funk Software**  
(617) 497-6339  
www.funk.com

**ZYXEL COMMUNICATIONS, INC.** has an-

nounced Prestige 128L, a bridge/router with integrated Simple Network Management Protocol for LAN-to-LAN connections over Integrated Services Digital Network Digital Subscriber Line (ISDL).

According to the Anaheim, Calif., company, the bridge/router enables data transmission at 128K bit/sec. over existing network infrastructures.

Prestige 128L can act as an ISDL serv-

er or a client, and a pair of Prestige 128Ls can replace a terminal server used to connect remote workstations from the host side.

ISDL uses a single pair of copper wire such as a local loop two-wire telephone line.

Prestige 128L costs \$999.

**ZyXel Communications**  
(714) 693-0804  
www.zyxel.com



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## Software

Databases • Development • Operating Systems

## Briefs

## Data warehousing predictions for 1998:

- Web-based reporting software will be deployed in droves
- Web-based query and analysis tools will catch on more slowly
- Packaged applications will increasingly be tied to data warehouses
- Opportunities for off-line loading of warehouses will shorten or disappear

Source: Patricia Eckhart Davis, Boston

## Bogus buys Stingray

Officials at C++ and Java tool-maker Bogus Wave Software, Inc., in Corvallis, Ore., said the company will buy Meriville, N.C.-based Stingray Software, Inc., which also develops object-oriented tools for Windows programmers. Terms of the deal, expected to close next month, weren't disclosed.

## BSS software aimed

Platinum Technology, Inc. this week plans to announce a decision-support offering that combines its information analysis server with new wizard-guided and user software.

Perspectives for Market Analysis is aimed at brand managers and other users who want to analyze sales data and demand trends, said officials at Oakbrook Terrace, Ill.-based Platinum. Prices start at \$500,000.

## Data mining for retail

NovVista Software, Inc., in Cupertino, Calif., last week announced retail-oriented data mining software aimed at analysis of product assortments at individual stores. The RDE-Assort package can be used to determine which items should be carried at different stores and the appropriate quantities to stock, NovVista officials said.

Pricing starts at \$75,000 for an annual license. NovVista also announced a prototyping program for the analysis of two product categories.

## OLAP MARKET

## Bracing for Microsoft

By Craig Stedman

OLAP server vendors are getting ready for Microsoft Corp.'s upcoming arrival in their market—and so are some of their customers.

Microsoft's plan to ship an online analytical processing (OLAP) engine later this year is pushing rivals-to-be to figure out ways to compete and coexist with the Redmond, Wash., software giant and its expected cut-price pricing.

Oracle Corp. and Arbor Soft-

ware Corp. hope that their enterprise analysis capabilities will keep them comfortably above the fray. But other high-end OLAP vendors, such as MicroStrategy, Inc. and Seagate Technology, Inc., are openly inviting Microsoft's product to be a lower-end companion to their analysis servers.

That kind of coexistence could be "the best of all worlds," said Bill Mantega, data warehouse director at Commercial Union, Insurance Co., in Boston.

Commercial Union uses MicroStrategy's DSS Server relational OLAP software to analyze financial data stored in a Microsoft SQL Server database. That lets users drill deep into the insurer's detail-level data, "but we're finding that on some applications we need more speed," Mantega said.

Microsoft's OLAP server might help bridge the performance gap because it will support both relational and multi-dimensional analysis. Mantega added. If Commercial Union can mix the two engines to fit its twin needs for speed and access to big chunks of data, "then we're kind of hit a home run," he said.

MicroStrategy officials in Vienna, Va., said a DSS Server upgrade due in the second half of this year will support a Microsoft-designed OLAP interface, setting up the product as a gateway to big data warehouses that could overwhelm Microsoft's OLAP engine.



Mixing Microsoft's OLAP engine with MicroStrategy's could be "the best of all worlds," says Commercial Union's Bill Mantega.

Officials at Seagate, in Scotts Valley, Calif., said its software unit plans to do the same thing with a version of its Helios OLAP server that is also scheduled for release this year.

Other vendors aren't so eager to embrace Microsoft's Plato OLAP server, which begins beta-testing this month (CW, Jan. 12).

Arbor, in Sunnyvale, Calif., plans to tie a sales analysis application it bought last month to Plato. But the company also

OLAP, page 56

## New Oracle applications that support flow manufacturing:

Product	Use
Line design balancing	Models business processes and assembly line flow
Kanban planning and execution	Supports Kanban just-in-time inventory replenishment processes
Production execution	Lets users manage the production process

By Randy Weston

ENTERPRISE RESOURCE planning (ERP) vendors are starting to take a serious look at the hot trend in manufacturing techniques—flow manufacturing.

Also known as just-in-time, agile or demand-driven manufacturing, the technique was designed to let manufacturers build products to order rather than stockpiling parts and keeping a high inventory of completed products. Vendors such as Oracle Corp., in Redwood Shores, Calif., and SAP America, Inc., in Wayne, Pa., plan to release products in the spring with the next major release of their application packages.

"[Users] are re-engineering their products to be products that can be configured and

manufactured to order, and they are re-engineering their business processes to support that," said Jim Shepherd, an analyst at Advanced Manufacturing Research, Inc., in Boston. "It's the continuing evolution from the fixed-factory, mass-production, make-to-stock mentality that has dominated manufacturing for 50 years."

## SMOOTH TRIP

Flow manufacturing keeps the assembly line on one track so a product continuously and efficiently moves through the plant from beginning to end.

The traditional method is to divide a manufacturing process into sections so that different parts are made for each product on a set schedule.

ERP vendors, page 57

## Sybase tool offers control

► Modeling help for data warehouse designers

By Gordon Mah Ung

create test data.

That is one of the new features Sybase, Inc. built in to the latest version of its PowerDesigner database design tool.

The update also adds support for Microsoft Corp.'s Active Server Pages—to create server-based applications—and includes the ability to graphically compare two database models side by side and merge the differences.

Database tool, page 56

PowerDesigner's database building features help users model data warehouse applications and browse sample information



## Happy New Year from IBM.

It's the new year. Traditionally, this is a time when all of us take a moment to write down our list of resolutions. Resolutions that are, typically, all but forgotten by the end of January (early February at the latest).



Well, we'd like to stand up and say, right here, right now, that this will not be the case with IBM. Because our list of resolutions not only marks a change in the way we do things from last year to this year, but establishes an entirely new way IBM will sell personal computing solutions. Forever.

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to retool the way we manufacture and distribute our personal computing solutions.



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Estimated street price (ERP) for model 286. Actual street prices may vary. Model 286 includes 100 MHz Pentium processor, 12" screen, 1.3GB HDD. Other features available for an additional charge. Other models up to \$3,000 (ERP). IBM reserves the right to alter product offerings without prior notice. U.S. and/or other countries. The IBM logo, logo and Pentium are registered trademarks and MMX is a trademark of Intel Corp. Not all systems feature the Pentium II processor. Microsoft Windows and Windows NT are registered trademarks of Microsoft Corp. PCs illustrated in this ad ship with an

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## OLAP

CONTINUED FROM PAGE 33

is rushing to move its OLAP product line higher up the enterprise food chain. Its latest step came last week, with the announcement of an object-oriented development tool that is supposed to free

users of its Essbase OLAP server from heavy-duty manual coding.

Meanwhile, Oracle, in Redwood Shores, Calif., is spearheading development of an OLAP interface specification to compete with the one being put together by Microsoft. The new spec is being released this week by the 13-member OLAP Council, although Arbor and some other members aren't taking part in the announcement.

Plato's scalability remains to be seen, said Don MacTavish, an analyst at Meta Group, Inc., in Stamford, Conn. But Microsoft's commodity pricing should be hard to match for general-purpose or departmental OLAP uses, he added.

George Davis, chief information officer at Busco, Inc., in Harrisonburg, Va., said Microsoft's entry won't entice the poultry company to switch its OLAP allegiance from Arbor. "They've been in

the business for a long time, and we're pretty much very satisfied with them," he said.

But Kenny Nalepa, manager of decision support services at Shell Services Co., said he expects to add Plato to the Arbor and Oracle servers already in his OLAP arsenal. Nalepa's staff builds analysis applications. "We're market-driven, and I expect Microsoft to capture a significant share of the market just because it's Microsoft," he said. □

## Advertisement

## Managing Re-Systemization

How U S WEST Dex moved from a mainframe to a distributed environment with PATROL

**U**S WEST Dex, one of many U S WEST companies, sells Yellow Pages advertising, related mailing lists and other products that are derived from telephone directories. In all, they publish over 300 directories with over 42 million printed copies.

Handling all of this publishing and taking care of nearly half a million USA and international clients calls for complete distribution of data 24 hours a day. All of the company's critical applications must be available to thousands of users.

The original mainframe needed upgrading and the decision was made by U S WEST Dex management to move to a distributed environment. Over a period of many months, operational processes were decreased on the mainframe and increased on the distributed systems.

U S WEST Dex created a new group called the "System Management Center" (SMC) to recommend products to help them ease and manage the transition. As interaction with the SMC progressed over a couple of months, one partner relationship between two vendors stood out, that of Hewlett-Packard and BMC® Software.

"We found that the partner relationship between these two companies was able to satisfy a broad range of our needs. The joint presentation of their individual products tended to complement and even strengthen each other. We saw clear advantages to both vendors working with us as a single team rather than separately. We awarded them our contract jointly and plan to order more later this year," explains Project Manager Henry Vargas of U S WEST Dex.

"Our business-critical applications have been re-architected into the client/server model to help give us a competitive advantage. We use the Hewlett-Packard systems due to

their mission-critical capabilities, high performance and the ability of Hewlett-Packard and BMC Software to put together a solution."

These products will provide U S WEST Dex with the ability to collect information from their new distributed computing environment and process it to report the status of individual elements within their IT environment. They will be able to graphically show the current status of all elements of their enterprise, including networks, systems, applications and databases, and manage them through one console. They should realize a seamless, easy transition of critical systems with reduced user downtime.

"We are pleased to be working with BMC Software on this project," said Business Development Manager Travis Mueggen, of Hewlett-Packard. "We have worked with them before and have always felt that our products, services, support and education complement each other. Together, we can always provide our customers with a complete, timely and cost-effective solution to their integrated network and system management needs."

U S WEST Dex plans to incorporate more of the Hewlett-Packard and BMC Software products to provide additional support for IT operations, performance monitoring and IT administration.

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## Database tool

CONTINUED FROM PAGE 33

PowerDesigner is made up of six modules: ProcessAnalyst is used for identifying and capturing data flow in a business; DataArchitect for conceptualizing and designing the database; WarehouseArchitect for data warehouse design and constructing; AppModeler for physical data modeling; MetaWorks for management of models and team design; and Viewer for browsing the model information.

Merv Adrian, a vice president and senior analyst at Giga Information Group, in Santa Clara, Calif., said the most significant component of the upgrade is for data warehousing. Adrian said Sybase, in Emeryville, Calif., and LogiWork, in Princeton, N.J., are the market leaders in that space now.

## CONTROL IS CRITICAL

"As data warehousing and data marts start maturing in more and more organizations that have now had more experience, the ability to control and manage the environment has become a critical success factor in moving their data warehouse technology forward," Adrian said. "Sybase will now have much of that solution."

Richardson said McCain, a food processing company with 15,000 employees that is based in Florenceville, New Brunswick, had adopted PowerDesigner as a standard database modeling tool.

The ability to reverse-engineer McCain's existing legacy on an IBM AS/400 machine is a time-saver, he said. Still, Richardson said the product could use improved functionality with AS/400s, and he would like to see better educational materials he can use for training others.

Other users also had positive reactions to the upgrade.

"We chose PowerDesigner because it's the most complete design and modeling tool available on the market today," said Frank Mussemann, data administrator at Fleet Financial Group, Inc., in Boston. "We're using the tool set for data warehouse development and feel PowerDesigner provides us with a consistent, adaptable structure which minimizes data redundancy and improves the performance of our applications that access data."

PowerDesigner is available in a bundled package or as modules. □

## ERP vendors

CONTINUED FROM PAGE 52

The flow manufacturing concept has been around for several years, but many manufacturers have been unable to implement it because of a lack of systems to support the idea, Shephard said.

For example, Plantronics, Inc., in Santa Cruz, Calif., has been waiting for Oracle to come out with such a product

so that it could move to the new technique, according to Sadeep Rikhy, chief information officer at the maker of headset telephone systems.

As a fairly small information technology shop, "we have a tendency to buy rather than build," Rikhy said. "For us to do flow manufacturing, we need an ERP vendor to come up with something to support it."

MagneTek, Inc., in Nashville, decided

not to wait. The \$1 billion maker of electrical equipment is rolling out Oracle Applications Version 10.7, and a home-grown flow manufacturing application will be bolted on to the Oracle package.

Tom Pike, director of corporate management information systems at MagneTek, said that at the time that his company was looking for an ERP system, none supported flow manufacturing at the level the company wanted.

"We do not like to install products until they have been on the market for six months to a year," Pike said. "[Flow manufacturing support] has been needed for awhile."

Oracle should be first to market with a product. The company announced last week it will have available in the spring a suite of applications to support both flow manufacturing and traditional methods. □

## NEW PRODUCTS

**LEGAFO SYSTEMS, INC.** has announced Networker Business Suite Module for Dynamic Server.

According to the Palo Alto, Calif., company, the backup and recovery software supports Informix, Inc.'s Dynamic Server with Extended Parallel Option on Unix. It was designed to allow online full and incremental backups, automate the backup process and provide disaster recovery.

The product costs \$5,000 per Informix server.

**Legato Systems**  
(650) 854-6000  
www.legato.com

**PC DOCS, INC.** has announced CyberDocs 2.0, World Wide Web-based document management software for use with Microsoft Corp.'s BackOffice.

According to the Toronto company, CyberDocs is an intranet-enabling client that gives users document management control on desktops and in applications. DocsFusion Server, also from PC Docs, is the back end that enables access to document repositories.

Pricing ranges between \$90 and \$300 per seat depending on the number of users.

**PC Docs**  
(617) 279-2000  
www.pcdocs.com

**SYMANTEC CORP.** has announced Norton AntiVirus for NetWare 4.0, virus scanning software for Novell, Inc. NetWare servers.

According to the Cupertino, Calif., company, the software uses proprietary technology to analyze program behavior and detect known and new viruses.

It also detects and repairs macro viruses and encrypted polymorphic viruses. The software is based on an extensible engine that can be reprogrammed each month with downloaded virus definitions.

The price for one server and 10 workstations is \$499.95.

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## Servers &amp; PCs

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## Briefs

## Study: Thin is in

Thin clients are the most cost-effective way to gain high-speed access on corporate intranets and the Internet, according to a study released last week by Meta Group, Inc., in Stamford, Conn. Network computers are easier and cheaper to support than stand-alone PCs. The study was co-sponsored by thin-client and PC manufacturers.

## Hitachi laptop drives

Hitachi America Ltd., in Bristleboro, Calif., has announced a family of 2.5-inch disk drives to try to strengthen its position as a leading disk supplier to notebook PC vendors. Hitachi's 5G- and 4.1G-byte Slimline disk drives are shipping now, and the 3.5G-byte Super Slimline disk drive is slated to ship in April.

## Alpha price cuts

Digital Equipment Corp. is reducing the price differential between its Alpha and Intel Corp.-based Windows NT server systems with a new line of aggressively priced NT-only Alpha servers. The Maynard, Mass., vendor also is merging its Alpha NT product line with its Intel-based NT servers. For the future, Digital will position its Alpha servers as high-end extensions of its Intel lineup, targeted at specific application segments.

## STORAGE FORECAST

Worksite forecast for network operating system storage management software

■ All platforms  
■ NT



\*Projected

Source: International Data Corp., Framingham, Mass.

## Not ready for prime time

► Bare-bones PCs aren't for most corporate users  
By April Jacobs

USERS MAY SUB \$1,000 PCs MAY be a good choice for low-end users, but with slower processors and bare-bones memory, they aren't ready for corporate number-crunchers or graphics gurus.

However, despite a less-than-stellar initial lineup for corporate user types, observers said the inexpensive entry-level PC has caught the eye of buyers who are willing to forgo

bells and whistles for simple functionality. And some users also see the first round of sub-\$1,000 PC offerings as a sign that prices will keep falling.

The trend toward lower prices

will continue to spread according to analysts.

"I think the pressure is going to continue to lower prices overall. But for corporate users, I don't think the system levels are quite good enough yet."

said Matthew Merrick, vice president of information systems at Merrick Printing Co. in Louisville, Ky.

Merrick said he purchases systems with 200-MHz Pentium 56k/50,000 PCs, page 62

## Some sub-\$1,000 PCs and configurations:

Model	Processor	Memory	Storage	Operating System
Compaq	\$799/Presario	200-MHz AMD-K6	32M bytes	2.1G-byte
Packard-Bell	\$999/Dialit	133-MHz Pentium	16M bytes	1.7G-byte
Hewlett-Packard	\$984/Vectra	166-MHz Pentium	16M bytes	1.6G-byte

## DISK ARRAYS

## Companies look to open up storage

By Nancy Dillon

MATT JACOBY HAS a plan to help make storage at his company's national data center more efficient. He is going to consolidate the dedicated storage systems of multiple servers into one "open" system that can attach to multiple server platforms.

His company, Eden Prairie, Minn.-based transportation contractor Robinson Worldwide, Inc., has Windows NT as its primary platform, but some NetWare and Unix servers also are mixed in.

"It's nice to know that I can connect multiple systems to an array now. But even more important is knowing that I won't have to reinvent in a new system if there are changes in the dominant industry vendors down the line," said Jacoby, network manager at Robinson Worldwide.

## ARRAY ARRIVAL

JACOBY is evaluating a new disk array that was released this week by Xintech Corp., also in Eden Prairie. The array, called Magnitude, is scalable from 45G bytes to 1T byte of capacity.

Open storage, page 64

By Kim Girard

TO SOME USERS, the PalmPilot is becoming as versatile as the Swiss Army Knife.

Want to tie a hundred PalmPilot users to corporate electronic mail? You can do it. Need a reminder to pick up milk on the way home? Set the PalmPilot's alarm. Need to track clients and hours spent in a courtroom? Go right ahead and install the software.

According to PalmPilot maker 3Com Corp., about 3,500 people are now programming for the pocket-size device, some

for large corporations' sales forces, hospitals, law firms and the government. Noblestar Systems Corp., in Falls Church, Va., for one, customizes applications for companies that include

"The main advantage to using the [PalmPilot] is going to be capital cost, [small] size and its ease of handling and use."

- Mike Clark, Vanguard Cellular

Wal-Mart Stores, Inc., Levi Strauss & Co. and Federal Express Corp. Some applications will enable hundreds of employ-

ees to use the PalmPilot to dial in to a server and access sales information over Internet connections.

Despite its small screen and limited memory—1M byte for the PalmPilot Professional—analysts said the PalmPilot is a perfect alternative to a laptop for lower-end sales applications that don't require complicated software. Users can manage contracts, fill out spreadsheets, scribble orders using Graffiti and access a weekly schedule.

"If you need sophisticated programs done on the PC, obviously it's not going to work," said Mike Clark, a PalmPilot user and senior product manager for wireless data at Vanguard Cellular Systems, Inc., which operates as Cellular One in PalmPilot, page 64

## SOFTWARE VENDORS TARGET PALMPILOT

Product	Company	Address	Phone	Price
HandWeb	Smartcode Software	www.smartcode.com	Internet browser	\$69.95
Pilot Financial Consultant QuickPac	LandWare	www.landware.com	Financial calculator	\$49.95
Time Expense Auto Keeper	Devix Programming	www.devixprogramming.com	Time, money and mileage tracker	\$44.95
TimeReporter for Pilot	Iambic Software	www.iambic.com	Time and expense tracker	\$99.95
QuickSheet	Cutting Edge Software	www.cesinc.com	Spreadsheet	\$49.95

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# PalmPilot hosts versatile apps

CONTINUED FROM PAGE 61

Greensboro, N.C. "The main advantage to using the Pilot is going to be capital cost, [small] size and its ease of handling and use," Clark said.

## LESS TO LUG

For others, using the PalmPilot means carrying fewer devices.

Rob Beck, an associate in real estate at GE Capital Corp., in San Francisco, uses The Financial Consultant, software from Oradell, N.J.-based LandWare, Inc., on his PalmPilot that replaces his Hewlett-Packard 921C scientific calculator, which is about the size of the Palm Pilot.

"It allows you to not have to lug [the calculator] around," Beck said. "The Pilot application is not quite as comprehensive as the HP 921C, but it's good enough."

The application enables users to determine present and future value of real estate, calculate interest rates and amortization, and do basic scientific tasks. LandWare also offers the Pilot Key, an adapter and software that enables users to attach Apple Computers, Inc.'s low-power Newton keyboard to the Pilot.

Lawyers also have found value in the PalmPilot.

David G. Weil, a bankruptcy attorney in Long Beach, Calif., uses an application called Time Expense Automobile Keeper (TEAK) on his PalmPilot Professional to bill clients more accurately. TEAK was developed by Syracuse, N.Y.-based Davis Programming.

Weil typically enters a client's

**"For anyone that does time tracking and billing, [the PalmPilot] is fantastic."**

— David G. Weil, attorney

name into the PalmPilot before leaving for court and starts a timer to track how long he spends on each client. He synchronizes that information with his PC when he returns to the office to avoid recording billing information twice.

"For anyone who does time tracking and billing, it's fantastic," Weil said. "It helps me to catch all the money I can, money that used to go out the window."

At the Unencumbered Entertainment Group, in Bethel, Conn., eight employees use a PalmPilot to track client budgets, send and receive E-mail and write memos and outlines, according to CEO Rick Levin. The company uses Quicksheet, a spreadsheet application made by Plano, Texas-based Cutting Edge Software, Inc. that automatically synchronizes with Microsoft Corp.'s Excel on a PC after changes are made on a PalmPilot.

"We needed to not have to open a laptop on the road," Levin said. "We certainly didn't need the power of a laptop."

Levin uses ToolMagically, from ToolPoint Software, which enlarges letters and telephone numbers on the PalmPilot screen. He also uses MemMaker, a utility that enables users of the handheld to compress documents, which is particularly handy for long legal contracts. Levin said. □

**□ PalmPilot compared with Windows CE handhelds.**  
Page 69

# Sub-\$1,000 PCs not ready for prime time

CONTINUED FROM PAGE 61

tium processors and at least 128M bytes of RAM and a 4G-byte hard drive for about \$1,800 each. That configuration is well above what most sub-\$1,000 PCs feature.

For example, Palo Alto, Calif., Hewlett-Packard Co.'s Vectra VI PC, priced at \$984, features a 160-MHz Pentium processor, adequate for average word processing and light spreadsheet use.

## NOT ENOUGH MEMORY

But with only 16M bytes of RAM, the machine doesn't meet PC 98 specifications that call for at least 32M bytes of RAM — about what it takes to run Windows 95 with several applications loaded and with good performance.

Dell Computer Corp., in Round Rock, Texas, has lowered prices on higher-end machines aimed specifically at corporate users.

Officials said the company will go after users who want lower prices but optimal performance. The company is offering Pentium II-based systems for about \$2,300 — well below last fall's \$3,500 price tag.

The cheap PC may also allow companies to put desktops in places they haven't been before.

For example, a recent International Data Corp. study found that nearly half of the PCs pur-

chased over the next year will be in the sub-\$1,000 category — and will spur a rise in PC purchases this year.

But that is likely to occur more in smaller and midsize businesses than in large corporations, where support costs are monumental and on every manager's mind, analysts said.

But those users aren't the bulk of corporate America, they said.

"You might find this new class of machines is appropriate for a former terminal user or one with a narrowly defined set of applications to use, but for most end users with a robust set of applications, it's just not what they're looking for," said Chris Goodhue, an analyst at Gartner Group, Inc., in Stamford, Conn.

"Every PC is a large commitment, the smallest of which is the cost of the hardware," said Paul Mascara, corporate director of information technology at C. R. Bard, Inc., in Murray Hill, N.J. "Because when you're dealing with PCs, the biggest issue businesses have to deal with is support."

Added Beverly Russell, director of information systems at Smith & Sons Ltd., in Wynona, Ontario, "The price of the PC isn't the issue. It's that you still have all of the other issues, like support and licensing, to deal with." □

# Companies look to open up storage

CONTINUED FROM PAGE 61

can attach to as many as eight servers simultaneously. It supports Windows NT and NetWare. Interface software for other platforms, including Unix variants from Sun Microsystems, Inc. and Hewlett-Packard Co., are due later this year.

Although Xstorex is much smaller than storage market leaders such as EMC Corp., in Hopkinton, Mass., and IBM, it offers competitive prices and some performance gains, users and analysts said. EMC offers the Symmetrix line of disk arrays, and IBM offers 7133 arrays.

Magnitude has software that shares total available disk drive horsepower and RAID protection with every attached server. Pricing starts at \$87,500.

## GETTING IT TOGETHER

Storage consolidation is a growing trend in information systems, users and analysts said. According to Mike Peterson, president of Santa Barbara, Calif.-based Strategic Research Corp., shared storage systems

that serve multiple servers will be the norm in "a few short years."

Peterson said users who manage servers dedicated to applications such as data warehouses or Microsoft Exchange probably will choose systems that directly connect with servers via SCSI, Fibre Channel or Escon. Meanwhile, users with less mission-critical servers may turn to network-attached systems for open storage. Those arrays can attach directly to networks via the print server do.

Two new disk arrays in the network-attached storage space are the Primor-Stor NAS2000 from Blue Bell, Pa.-based Unisys Corp. and the UDSS Disk Array from Markham, Ontario-based Legacy Storage Systems Corp. The NAS2000 can house between 54G and 500G bytes of data and includes Windows NT software, mirrored cache and RAID. It works with Windows NT and Unix protocols. Support for NetWare, Hypertext Transfer Protocol and file transfer pro-

tool is due in the second quarter. Pricing starts at \$19,500.

The Essex County Registry of Deeds, in Salem, Mass., uses the NAS2000 to house a 400G-byte database of scanned-in property deed images. The public can access the database over the Internet via a Web server that resides on the NAS2000's network. Internally, Windows PCs access the storage server directly.

The images that reside on the networked storage array are accessed internally by network-attached Windows PCs and over the World Wide Web through the registry's network-attached Web server.

"We went with the Unisys system because platform independence is very important to us. We do not have the funding to maintain a data center or highly technical staff," said Michael Miles, assistant registrar of deeds and operations coordinator at the registry office. "Open storage will help us to stay up with the marketplace." □

# NEW PRODUCTS

**SONY ELECTRONICS, INC.** has announced the TruCom 500 for Windows NT, a desktop videoconferencing system for Windows NT Workstation 4.0.

The San Jose, Calif., company said the system offers videoconferencing, PC telephone capability and H.323 LAN access. It includes software to support T120 data collaboration and lets users add a xBRI board to achieve improved video quality at 384K bit/sec.

It comes with a camera with a built-in microphone.

The TruCom costs \$1,995. **Sony Electronics** (408) 432-1600 [www.sony.com](http://www.sony.com)

**TANGENT COMPUTER, INC.** announced the Enterprise X.D, a dual Pentium II processor-based server with an optional module for embedded RAID.

According to the Burlingame, Calif., firm, the server was designed to act as a Web, database, electronic-mail or online transaction processor server. It includes Intel Corp.'s 440LX chip set to maximize Pentium II performance. It has nine expansion slots, can house 1G byte of memory and has five standard hard-drive bays that are hot-swappable.

Pricing starts at \$6,995. **Tangent Computer** (650) 342-9388 [www.tangent.com](http://www.tangent.com)

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# ON GROUNDHOG DAY ALL BUT ONE\* WEB SEARCH ENGINE WILL BECOME OBSOLETE

ANNOUNCING RICK BENNETT'S GROUNDHOG DAY

DEAD-COMPANIES-CAST-NO-SHADOWS SEALED-BID AUCTION

**M**y name is Rick Bennett. You don't know me, but you've seen a whole lot of my ads over the last 14 years. I'm the one-man advertising agency that took Oracle from \$15 million to \$1 billion between 1984 and 1990.\*\* Those ads put a lot of companies on the ropes. Ashton-Tate, Ask, Callinet and Ingres, to name just a few (the detailed war stories are at [www.rickbennett.com](http://www.rickbennett.com)). The only reason I bring up ancient history is so you'll believe me when I suggest one ad may cause some serious San Jose quakes on Groundhog Day, 2/2/98. This ad, to be exact.

"One ad?" you ask. "You've got to be kidding!" Nope. The man who taught me advertising — Tony Schwartz — destroyed Barry Goldwater's presidential campaign with one ad (Daisy), ran one time, on one TV network (CBS). So unless I've gotten completely full of myself again — it happened once before, I sold my electronics company and blew everything running for Congress — I think just one ad might shake things up on the Web. But that's really up to you.

I found a new company, WordCruncher† they don't have any money. Yet. When they came to me, they demonstrated the hottest search technology on the planet. Faster, more exotic, more flexible, yet easier to use than anything else, anywhere else. And they had a patent on it! When they asked me to introduce them to some venture capitalists, I just laughed. "I've been waiting my whole life for you guys!" I said. "If your patent holds water, I'll hold an auction to license just the Web search engine rights for your technology. You'll raise millions and, other than a meager single-digit stock option for me, you'll not have to give away a nickel's worth of equity. There's just one thing: They gulped at "one thing."

"Yeah. The one thing we need to succeed with a licensing auction is for you to come up with an e-mail watchdog program using this technology that we can practically give away. You do that, the market will do the rest."

**"CREATE AN E-MAIL WATCHDOG PROGRAM THAT I'll WORK WITH MICROSOFT, NETSCAPE AND EDGEMO. GIVE EVERYONE A SIMPLE, FAST, PERFECT WAY TO ACCESS EVERY E-MAIL THEY'VE EVER SENT OR RECEIVED, & THEY'LL BE GLAD TO DISCUSS EVERY OTHER WEB SEARCH ENGINE THAT DUPLICATES IT."**

The lights went on, and so did the thinking caps. It took one program within three days to produce the Microsoft version of the WHEW!†† — which stands for WordCruncher E-mail Watchdog — program. Another week for the Netscape version. By auction time, there'll be a Eudora version.

Is your e-mail as big a mess as mine was? Log onto [www.wordcruncher.com](http://www.wordcruncher.com) and download the version you want for just \$9.95. If you want a CD with WHEW! and over 600 of the greatest books ever written — which you can search, study and research as you never thought possible — it'll be just \$29.95! Talk about a "killer" application! You'll use WHEW!, and then *start* upon the same familiar Web search capability! WordCruncher and WHEW! are going to do for the Web and e-mail what Visalade did for the desktop PC.

**THE WEB SEARCH ENGINE LICENSE WILL BE AWARDED ONE WIN FROM TODAY IN SAN JOSE — OR — UNLESS I'VE REALLY WORKED OFF THE CEOs OF EVERY MAJOR SOFTWARE COMPANY.**

Two weeks ago, 52 computer executives received, via FedEx, a "reaser" mounted on foamcore. I told them they were about to be badly startled. Exactly six days ago, they received a follow-up telling them how important WordCruncher could be to their survival. Eggs being what they are, if I grossly miscalculated their reaction to a threat, then I'm going to be awfully humble in San Jose on Groundhog Day. Well, maybe not. Maybe a few hundred thousand of you might make WHEW! the hottest little ten-dollar investment of the decade. One ad? Just maybe.

The great Rick Bennett turns out to be the swiftest link in this whole adventure. As it should be. The star of this show is mere, blindingly superior technology. I've waited a long time for it. So have you.

**IF YOU DIDN'T GET INVITED TO THE AUCTION, EVEN IF YOU'RE NOT IN THE SEARCH ENGINE BUSINESS, YOU MAY WANT TO MAKE A BID FOR AN EXCLUSIVE IN YOUR VERTICAL NICHE. E-MAIL [rick@rickbennett.com](mailto:rick@rickbennett.com) FOR CREDENTIALS AND DIRECTIONS.**

CEOs who *don't* attend the auction may be shown WordCruncher by a really unhappy stockholder at an annual meeting. For example, Dr. Jacobs, you may want QUALCOMM to bid on exclusive ownership of WHEW! Larry Oracle's ConTen program *could* show him in actual context. And Bill, the whole world shudders at what Microsoft would do with a patented user interface... unless Scott overbids you for a Solaris exclusive. But fair warning: Don't even think about reverse engineering to compete with the winning bidder. WordCruncher controls the patent. So even if the auction winner doesn't put you out of business (before you figure out half-a-million lines of patented — number 5,345,551 — code), the WordCruncher shareholders will.

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# Mobile Computing

Special Section: Remote Access • Portable Computers • Mobile Strategies

## Briefs

### Handhelds to grow

A recent International Data Corp. study suggests that 1998 will be a bumper year for smart handheld devices.

Unit shipments of personal digital assistants (PDAs), smart phones and handheld computers are expected to increase more than 60% over last year to 8.5 million. The report predicts iCom Corp.'s PalmPilot will continue to dominate the PDA market this year, but Microsoft Corp.'s Windows CE will take 25.6% market share, the study said.

### Trimming costs, prices

Toshiba America Information Systems, Inc. has reduced prices on its Satellite, Portege and Terra notebooks between 6% and 10% because of the release of 486-MHz Pentium-based notebooks. Prices for 16 notebook models fall.

On the low end, the Satellite 380CDS, with a 100-MHz chip and 320 bytes of RAM, went from \$1,999 to \$1,999. The Portege 300C1, with a 133-MHz processor, 320 bytes of RAM and 1.5-Gbyte hard drive, dropped from \$2,999 to \$2,999.

And the Terra 740C1D, featuring a 166-MHz Pentium MMX processor, 640 bytes of RAM and 2-Gbyte hard drive, fell from \$3,499 to \$3,499.

### Notebook computer complaints

Weak battery life	25%
Difficult touchpad/mouse pointer	14%
Screen too small	11%
Poor screen quality	9%
Too heavy	8%
Small keyboard	7%
Other/Don't know	26%

Source: IDC notebook survey

Source: The Harris Group, Washington, on behalf of Information Electronics Headquarters, Arlington, Va.

## Light databases get some muscle

Remote access models improve performance

By Craig Stridman

WHEN LOCKHEED MARTIN CORP. built a remote processing application for a group of government facilities in Idaho, it based the project on a lightweight database that would be easy to manage in the field.

But, getting the database to handle the required processing load wasn't so simple.

"We had to develop the application with a lot of thought for how to maintain performance," said Justin Tozer, an advisory engineer at an Idaho Falls environmental engineering lab that

Lockheed Martin runs for the U.S. Department of Energy. "And we're probably pushing the limits of our servers right now."

Lockheed Martin uses Sybase, Inc.'s SQL Anywhere database to make information about treatment of hazardous and radioactive wastes available to workers at seven federal facilities around Idaho Falls. The application involves thousands of data elements and intensive on-the-fly querying, Tozer said.

Now the company hopes promised multiprocessor support being beta-tested by Sybase



Lockheed Martin uses a lightweight database to send information about hazardous wastes to remote workers

will boost throughput at busy processing times and ease the crunch on its servers. By August, Tozer said he expects to upgrade to Sybase's upcoming release, which is being renamed

Adaptive Server Anywhere.

He isn't alone. Other users who have had to make lightweight databases fit their needs are also counting on vendors to

Lightweight databases, page 70

### REVIEW: Handhelds

## Portable devices must be practical

By Kevin Fogarty

SOMETIMES COOL ISN'T enough.

That's the conclusion I came to after scanning the market to try to figure out which kind of portable device would be most useful for a mobile staff.

The most basic question was whether to go with a proprietary device such as iCom Corp.'s PalmPilot or with a PC-like device running Microsoft's Windows CE. It all came down to portability vs. power.

Of the three devices I tested, Hewlett-Packard Co.'s 620-LX was by far the coolest. It runs the latest version of Windows CE and has a color touch-screen and Windows-like applications, including Solitaire (which turned out



HP's 620-LX is packed with features, but the package is too small to support them

to be its most popular feature among co-workers who stopped by to try it).

It was cool, but it was actually the least useful.

The 620-LX can easily do the basics—take notes, make and change appointments and keep a list of your contacts and their phone numbers. Plus, it can run lightweight versions of common desktop applications, including Excel, Word and PowerPoint. But all those features are crammed into a package that is too small to support them and too large to be conveniently portable.

The device is also awkward to use on the go. It is too big to easily slip into a pocket, al-

Practical devices, page 70

## Telecommuting offered to recruit employees

By Tim Ouellette

TELECOMMUTING has changed the way many companies work, and now it is starting to change how they hire employees.

With the information technology labor shortage making some firms desperate, more are using their telecommuting programs to lure professionals who don't want to be stuck in the corporate office. And the gains from telecommuting could make such programs the linchpin of recruiting strategies rather than just another benefit.

"When I advertise for a position, we advertise that we have telework options," said Katie Vanden, manager of administration at Kaiser Permanente Health Plan, Inc., in Portland, Ore. "We find it helpful not only in people coming in looking at the jobs but also in retaining people."

"Telecommuting" was one of my criteria to come to Deloitte," said Roberta Fox, manager of networking services at Deloitte & Touche consulting group, in

I want YOU to telecommute

Do you use telecommuting as a recruiting tool?



Basic 300 senior executives

Source: Deloitte Group, Montreal, N.Y.

New York. "And in some cases, it can be the reason for experienced people to stay with the company."

To attract workers, businesses are shoring up their fledgling telecommuting programs and making a concerted effort to turn them into a major part of their recruiting strategy. The

Telecommuting, page 70

► **REVIEW: Handhelds**

# Practical devices win out

CONTINUED FROM PAGE 69

though it is fine in a purse or briefcase. And it is difficult to use standing up — searching for a phone number at an airport pay phone, for example.

The 640-LX does a decent laptop impersonation, but it can't replace a laptop — the screen is too small to do presentations well, and the keyboard is too small for typing documents of any length.

And mass frustration is palpable as I wrote this article — neither the on/off button nor a forced reboot had any effect. I had to wait for the battery to run out. Neither of the other two devices I tried hiccuped.

This whole product category has the potential to be compressed during the next year or so, as ultralight laptops become more portable and misadventures — some running Microsoft's newly announced palmtop operating system — ramp up in power.

The smallest of these devices right now is Franklin Electronic Publishers, Inc.'s Rex PC Companion. The credit-card-size device slips invisibly into a shirt pocket and carries plenty of information for the calendar, contact list, notes and to-do list.

The only problem is that once you are mobile with Rex, you

can't change anything. No new contacts, no schedule changes, zippo. You have to write down your changes and add them later when you plug Rex in to your laptop. And it doesn't do electronic mail. Bummer.

**POPULAR PALMPILOT**

Somewhere between those two extremes is 3Com's PalmPilot. Proud possessor of wideheads everywhere, PalmPilot owns 66% of the handheld market,

according to Dataquest, in Sao Jose, Calif.

It isn't immediately obvious why. The interface is basic, and the PalmPilot is a vision in gray — not much of a looker.

But it has a calendar, address book, notepad, expense tracker, and E-mail. (However, it supports only versions of Lotus Development Corp.'s Notes that are older than 4.5, the one my office uses.) And software developers are flocking to write new

applications for it.

PalmPilot fits easily into a pocket or purse, it's easy to use standing up or on the go, and it lets you make changes and additions when you are away from your desk.

The specialized graffiti handwriting-recognition feature is a little awkward, and the marks for punctuation and commands aren't intuitive. I had to constantly look these up while I used the machine.

You won't want to take extensive notes on it, but short notes, new contacts and new appointments aren't difficult.

The personal information manager (PIM) that is its in-

terface on the PC is kludgier than dedicated PIMs such as Lotus Organizer or Microsoft Schedule Plus, but it does the job. And it is easy to synchronize the data with the handheld unit.

Its main competition, in fact, is the paper database, Mine can do everything PalmPilot can do except wireless E-mail and Sub-Hunt. And I have never had to add batteries.

But I did forget to buy calendar pages for this year, and PalmPilot filled in ably for a week or two until I could get some.

That's more than cool, it's practical. □

**HOW THEY STACK UP**

	HP 620-LX Hewlett-Packard Co. Palo Alto, Calif. www.hp.com	Rex PC Companion Franklin Electronic Publishers Burlington, N.J. www.frc.com	PalmPilot 3Com Corp. Mountain View, Calif. www.3com.com
<b>PRICE</b>	\$899	\$149.95	\$369
<b>PROS</b>	Runs common office applications, has familiar interface, keyboard allows some typing	Very portable, simple interface and low cost. What it does, it does well.	Very portable, can make changes on the fly, easy to use standing up
<b>CONS</b>	Too big to slip into pocket, keyboard and screen are too small to replace a laptop, hard to use standing up	Doesn't do enough, no E-mail, no changes when it's unsynced	Screen is hard to read in low light, some graffiti characters are nonintuitive, can't run Windows applications
<b>OVERALL GRADE</b>	B-	B+	A

## Telecommute

CONTINUED FROM PAGE 69

move is due in large part to the shortage of qualified technical people available, observers said.

"We've been tracking this for a number of years, and this is the first year people are saying that they are offering telecommuting programs specifically to attract qualified employees," said Adrienne Pletch, vice president of professional services at Olters Corp., in Melville, N.Y.

**ADDED BENEFITS**

A telecommuting plan lets businesses cast a wider net for skilled staff who may not want to move. It also can bring a monetary return.

"Other recruiting efforts require money but no return because you're landing the employee," said Gil Gordon, founder of Gil Gordon Associates, a consultancy in Monmouth Junction, N.J. Telecommuting offers a chance to reduce overhead costs from

office space and possibly increase productivity from some workers, he said.

One way to make sure telecommuting works well is a recruiting tool, observers say, is to make sure the program is formalized. That's because pilot or ad hoc programs may turn off experienced workers.

"With a formal program it is much easier to market [telecommuting] as a work option," Vi-lander said.

That's why managers can expect to see more telecommuting consulting services cropping up across the country, analysts say.

But companies must know when to offer the telecommuting carrot.

Many college graduates can be "pretty adamant" about telecommuting, one telecommuting manager said. But before working at home, most need to find first experience the social atmosphere of the workplace to acclimate themselves to how the company and corporate world works, Gordon said. □

## Lightweight databases

CONTINUED FROM PAGE 69

add the kind of functionality required by not-so-lightweight applications.

Like Sybase, Oracle Corp. is rolling out a more muscular release of its smallest relational database. The products, which were designed for end users who work on the road or in remote offices, each are getting Java support and other features meant to improve performance and scalability.

The appeal of SQL Anywhere and Oracle's Oracle Lite is two-fold: They provide mobile and remote users with bonafide databases that can be fed by corporate servers and used while off-line, and the runtime versions chew up less than the byte of memory and require little administration.

But lightweight databases haven't always made life easy for people building applications.

Unio Gas Ltd., which sells natural gas to 750,000 customers in southwestern Ontario, began using SQL Anywhere three years ago as a mobile database for anyone who inspect its gas mains. At the time, though, SQL Anywhere couldn't pass data to or get information from the utility's mainframe database.

"We wrote our own replication and that was pretty ugly," said Mike Landley, a database analyst at Unio Gas, in Chatham, Ontario. "We were a little ahead of the technology."

Unio Gas last year switched to an interim setup based on Microsoft's 32-bit relational Access database, with out links to a central server. Now in the works is an application that will tie Oracle Lite at the user end to an Oracle-3 database at headquarters. It is

due to be ready by August.

Using Oracle Lite was a corporate move to standardize on Oracle databases, Landley said, but a bidirectional replication feature that was added to Oracle Lite in December is a big plus.

Oracle, in Redwood Shores, Calif., also put support for storing Java objects and writing Java-based stored procedures in Oracle Lite 3.0. Emeryville, Calif.-based Sybase plans to do the same in Adaptive Server Anywhere 6.0, which is due in the second quarter.

Hilton Hotels Corp., in Beverly Hills, Calif., next year plans to give Adaptive Server Anywhere to as many as 500 workers who sell group and corporate bookings worldwide.

"They need to have information at their fingertips when they're in front of customers," said Joe Durouch, Hilton's chief information officer. But the size and global reach of the application probably will require the multiprocessing capabilities that Sybase is adding, he said. □

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### AGENDA

#### 8:30-12:00 BREAKFAST SESSION

- ▶ **Welcome and Introduction** Vicki J. Brown, Senior Vice President
- ▶ **Mapping the Route to Opportunity** Frank Gens, Senior Vice President, Internet Research
- ▶ **The Virtual Empire of the Corporation** Dave Vellante, Senior Vice President, Systems, Software and Storage Research
- ▶ **Telecom Catalyst: Broadband or Fast Track?** Gigi Wang, Senior Vice President, Communications Research
- ▶ **The Wired Market: Redefining Business and Industry** John Gantz, Senior Vice President, Personal Systems, Collaborative Computing, and Services Research

Session A 1:00 - 2:10	Session B 2:30 - 3:00	Session C 3:10 - 3:40
<b>TRACK 1: Internet</b>		
Internet Commerce - Where's the Money? Carolanne Robinson	The Firewall is Breaking: Taking Market Share Sean the Internet and Ethernet Build-Out Michael Anderson/Carroll	In Search of the Answer: Rethinking the Virtual Economy David Card
<b>TRACK 2: Personal Systems</b>		
The PC Market of Tomorrow Teresa Becker	IT Technology Breakthrough Scott Eubank	Shaping the PC Gamble Tony Anders
<b>TRACK 3: Systems</b>		
IT's Attack on the Enterprise Dan Eusebio	Charting the Enterprise - What and How to Take on Legacy Systems David Pappas	PC Servers: Are They Ready for Primetime? James Franklin
<b>TRACK 4: Software</b>		
The New Microsoft Software Industry Tony French	Supply Chain: Opportunities Change and Opportunity In the Global Applications Market Clare Gillies	World War Java Drew Quinn
<b>TRACK 5: Communications</b>		
IP Moves to the Enterprise: The Next Public Network Infrastructure Lee Dight	IP Drives Enterprise: The Future or Present for Value Mark Whelan	The New LAN Backbone: Broadband, A Switch Mark Levy
<b>TRACK 6: Services</b>		
Shifting from the Desktop to the Network Mike Koenig	Building Software: Lessons from the Field Paul Gilman	Getting Ahead of the Business Cycle for Windows Globalization and Project David Card

8:00-8:45 Top Headlines for 1998 John Gantz, Moderator

## Managing



### A MIS MIS SPECIAL

WOMEN IN INFORMATION SYSTEMS

# CRASHING GLASS CE

**How do you get to the top of the IS profession? Four female executives tell Ms. MIS columnist Laura DiDio what it takes to break in to a leadership role.**

**CW:** How did you get to the top? What was your formula for success?

**PAULINE NIST, TANDEM:** People first care whether you are a turkey or not. The "woman thing" is not so important as long as you're technically competent. But I found you have to pick your boss carefully. If you really want to get work that is valued by the organization, that you will be recognized for, you've got to work for somebody who will give you that opportunity.

You learn this the hard way. Because no boss ever comes out and says, "I won't give the good projects to women." You just figure out, looking at the last four things you've gotten, and the things all the men have gotten, that this guy is never going to

do it for me and maybe I should find someone better to work for.

**CW:** A woman at a lower or midlevel managerial position would say, "Hey, how do I get to pick my boss?"

**NIST:** I've always felt you own the responsibility for your career.

I went to work for a director of MIS at one point who was a nice guy, but was a retired Army colonel who had eight daughters. Here was a guy whose entire context was men at work, women at home. Over the course of six or eight months, I realized that he was never, ever going to be comfortable giving a plum assignment to a woman. You would talk to him, and he would say, "Oh,

no. I have daughters who are career women. How could I not be comfortable with women?" After a year of it, I just said, "I got to find another place to work."

It's a tough place for a woman to be. You can't go to [human resources]. What are you going to say? The guy talks the talk. The days of overt discrimination are gone. Today it's much more subtle.

**DOROTHY J. SMITH, DHL:** Women have to network within industry associations and user groups. Internally, you have to form alliances with businesspeople inside your company. Who do you trust? Do they trust you?

## THE PARTICIPANTS

## Carol Cain-Boudoures, 43

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## Dorothy J. Smith, 49

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## Pauline Nist, 47

Senior vice president and general manager  
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THE  
BUILDING

You won't form alliances just by demonstrating that you do a good job. You've got to do things so they trust you and know that when you say something, they can believe it and they can support it, and vice versa.

**NIST:** I don't see that men these days have time for golf and drinking and those things. They are much more interested in working with you to get something done, because there aren't enough hours in the day for anybody. If you establish trust and that deeper relationship, then you find people are much more willing to put

it on the line for joint projects where they can see that you both are really going to succeed.

Another thing: Seize the opportunity. I've never been in a place where there wasn't more work to do and more opportunity than there were people to do it. If you wait for someone to come along and say, "Would you like this project?" or "I'm going to empower you to do that," you miss the boat.

I see so many people who are afraid to do that, who think, "I'm not empowered to do that." You give yourself the power. If you do that, you very quickly get a reputation as somebody who is willing to do things, not just talk about them.

**CAROL CAIN-BOUDOURES, VISA:** You actualize it by taking on some risky opportunities and showing your commitment and your passion around

achieving that objective.

**CAROLYN LEIGHTON, WTI:** I would add: Think like a leader. These women don't wait to be told. And everything Pauline said spelled out proactive: "I'm going to take control, and I'm going to be in charge." That's really the essence of leadership.

**NIST:** There's a very subtle women's issue here. Women tend to look at an opportunity and say, "Maybe I don't have the qualifications." Yet men will jump in and take on the tasks for which you are more qualified. You watch some borderline incompetents, and inevitably you get to the point where you say, "I could have done a far better job than he did it. Why didn't I do it?"

**CW:** Do you ever find yourself tailoring your actions because men fear your power?

**NIST:** Certainly. What I like about the high-tech industry is that people want you to be aggressive as you deliver products. Then when they go to promote you, they say to you, "Well, gee, you aren't mellow enough to be a vice president." After I finally got to be a VP, I realized that you really could mellow out.

**CAIN-BOUDOURES:** I have a different perspective on it, because Visa is an international organization. If you're sitting across from a group of Japanese businessmen who are averse to direct confrontation, it's just culturally not acceptable to approach problems

or sensitive topics abruptly or directly. It's our job to do our homework and approach it as our audience needs to hear it.

**LEIGHTON:** I really like what Carol said about speaking to your audience. I don't see that as a compromise. I see that as being very smart and effective. I think the biggest drawback most people have — male and female — is that they are so "me"-centered, they forget that they first must understand how to deliver the message so that it's heard.

**CW:** Another thing is endurance, those 60-hour workweeks to gain visibility. Do you folks find that as well?

**NIST:** I've never found any way in the technology sector to do it without working those hours. People who are committed to projects do whatever it takes to ship them. You have to show you are ready to be there when things are tough.

**CAIN-BOUDOURES:** When I first got into technology, I found I had such a passion for it, I would have worked 48 hours a day.

**CW:** Can each of you give me an example of the smartest strategy you ever deployed to help you climb the corporate ladder or help smooth over rough waters?

**LEIGHTON:** I was negotiating a major contract with a very male-dominated environment and was getting nowhere. I was a woman [and] proba-

Continued page 77



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# CRASHING THE GLASS CEILING

CONTINUED FROM PAGE 72

by twice the age of the people in the environment, who were in their 20s or close to it. So I sent one of my sons who was working with me in the business to do business with them. I directed the whole thing from behind the scenes. And we got the contract.

**NIST:** Probably the single thing I did had to do with risk and picking your shots. I made my mark at Digital Equipment [Corp.] by doing the hottest microprocessor-based CMOS box that they had at the time, the VAX 6000. I probably got that project because the male contingency at Digital had been totally focused on bipolar [emitter-coupled logic] technology. I used to call it the "big machines for

can sell what I'm trying to do."

When I was working at Synnex [Corp.], I reported to the president of Synnex Research, a chemist who just positively hated computers. He was not going to approve computers for use in the lab. He did not want his scientists sitting behind green screens; he wanted them at the chemistry bench, doing chemistry. And, of course, there were no computers in the executive office.

When his administrative assistant was on vacation, his direct reports' assistants were called upon to fill in for her. When it was my assistant's turn, we figured out a way of showing him how he could do some of the things he wanted to do on the computer. She was great. After she left, we had a Mac installed in his office. We just changed his whole perception.

**CAIN-BOUDOURES:** I was thinking about something Pauline was saying. Step up to things that nobody else wants.

I was three years with Visa. There was this project to create a new Visa service that I'd been hearing about for two years, but it never happened. That's because everyone said it was impossible to get so many areas of Visa to collaborate. So I told my boss I'd take a crack at it if they really wanted to go with it. So the whole thing got dumped in my lap. We were doing all these things we had no idea how to do. In about 14 months, we delivered a system that in June brought in \$550 million in sales to Visa members and over \$1 million in revenue to Visa International.

People said, "How did you get all the technicians to hook up all this new stuff and get it working worldwide the way we did?" And all we could honestly say is, "We didn't know we couldn't do it."

**CW:** What advice would you give to lower- and midlevel women managers who want to climb the corporate ladder in high tech? How can they become VPs, CIOs, CEOs?

**SMITH:** Look for the opportunity and do the best you can.

**LEIGHTON:** Always remember, it's not what happens to you but the way you choose to perceive it that makes the difference.

**CAIN-BOUDOURES:** Right. Believe that anything is possible. Challenge yourself and others to push through to the edge of your level of comfort and beyond, to create what you want. Whether you're a man or a woman, some of our early training says: Stop when it doesn't feel good. I now know that's when I need to push the hardest for what I believe in.

**NIST:** Don't underestimate yourself. That's the single biggest mistake women make.

**CW:** When I first started talking to a lot of women for the Ms. MIS column, I would ask about the old concept of the glass ceiling. I was shocked to find that many of the women executives and MIS managers that I spoke with said, "What glass ceiling? I never really encountered that." I wondered, is this glass ceiling just a figment of my imagination? But it turns out it wasn't a figment of anybody's imagination. These women all had one thing in common: They just saw the glass ceiling as just another obstacle. They paid no attention to it and kept going.

**LEIGHTON:** Exactly.  
**CAIN-BOUDOURES:** It's true. □

*DiDio is Computerworld's senior editor, security and network operating systems. The above article is an edited version of her conversation with the executives.*

## 12 TIPS TO THE TOP FROM SUCCESSFUL WOMEN

■ **Pick your boss carefully.** Find someone who will assign you interesting work that will give you visibility.

■ **Form alliances with key players in the workplace.** It isn't enough to do a good job; you have to build trust. Go out of your way to get to know these people and show them you share the same goals.

■ **Take risks and seize opportunities.** Show initiative and take on the promising projects that others won't take. Build a reputation for getting things done.

■ **Think and act like a leader.** Take the initiative, take charge, take control.

■ **Speak to your audiences.** If you want to be heard, adjust your style and approach to fit the situation and the people. It's especially helpful when working with people of different nationalities, generations and ways of thinking.

■ **Figure out a style that works for you.** You don't have to play the corporate game the same way the men do.

■ **Demonstrate that you have endurance.** Put in the long hours needed to help the team get the job done. But it helps to love your work.

■ **Support from your family is a big advantage.** Behind many successful women, there is often a supportive husband.

■ **Don't be discouraged when you fail to sell an idea.** Figure out how to make the idea acceptable — and try again.

■ **Attitude counts.** If you perceive your situation as an opportunity, instead of a set of obstacles, you create the mindset you need to succeed.

■ **Don't underestimate yourself.** Don't agonize over whether you're qualified or have the skills. Push through your discomfort and doubt so you can take risks and seize opportunities.

■ **It helps to have a mentor.** Mentors provide guidance and visibility.

**COMPUTERWORLD**  
The four panel participants comment on working effectively with men, and balancing work and family this week at our Web site ([www.computerworld.com](http://www.computerworld.com)).

You can also listen to excerpts of their discussion with Computerworld columnist Laura DiDio at the site. DiDio this week will host a forum at the site on the issues dealt with in this article.

big men" program. None of them wanted to work on this risky-dink CMOS technology. Those little things Intel was doing were just chips that went inside of things. Out of that came an incredible amount of opportunity and a real ability to make a name for myself.

**SMITH:** If you have something you really believe in, you can't get discouraged because you don't sell it the first time out. Sometimes it's a matter of packaging; you can take the same idea that six months ago didn't work and sell it today. Look at it and ask: How can I make this idea acceptable so I



## WHAT WENT WRONG AT OXFORD HEALTH?

JIM CHAMPY



...in betting last summer's technology debacle at Oxford Health Plans will turn out to be more about a failure of line management than the collapse of the HMO's elaborate IS function.

That's an educated guess, because the company is saying only that somehow its systems failed to catch millions of dollars in medical care costs, resulting in a \$200 million charge and a write-off of more than \$100 million in premiums it failed to collect from customers.

As the formerly high-flying stock tumbled more than 75% in the past few months, Oxford Health's story is now taking its place next to Greyhound's reservations system disaster as the apotheosis of the ruinous effects of IT systems gone wrong.

In a press release, Oxford said it hired a new hotshot head of operations and is bringing in IS consultants "to review and report on its information systems capabilities and strategic plan, and to correct Oxford's processing of claims and premiums." The release also stated that the HMO is grappling with fast growth. In other words, its systems and operations couldn't keep up. That sounds like the problem America Online had when it was swamped with subscribers after it lowered its prices.

But that still begs the question: Who was watching the IT shop? The company has fired its chief financial officer, but I'm wondering if that executive was warned about the impending technology crisis. And if so, were the IT issues fully understood? My hunch is that Oxford's executives and its IS practitioners probably weren't speaking the same business language.

### HOW LINE EXECUTIVES SEX IT

As one who has lived on both sides of the divide, let me offer some advice to those on the technology side about how line executives think about IT.

In my experience, line executives look at IT in three ways: strategically, opera-

tionally and as a producer of some business result. The last includes more than simple efficiency. It could include, in Oxford's case, the competitive advantages of the low-cost service and highest customer satisfaction. It's a bit of an oversimplification, but for the purpose of helping IS professionals "manage up," the classifications work.

Today, when line executives look "strategically" at IT, they generally accept that technology will transform their business in a major way. But they struggle with how to get the work done. Should the IS organization build the new technology infrastructure itself? Buy a giant system from SAP? Hire loads of consultants? Outsource the whole thing? Or some combination of the above?

### OVERKILL

When an IS manager is asked to help in the decision, he usually prepares an exhaustive presentation of alternatives—with accompanying mind-numbing analyses and details on operations.

The essential fact for IS managers to grasp is that their line brethren—despite what they say—aren't really interested in hearing about operations or the minutiae of how systems will get built.

Line executives are trying to sense the IT organization's ability to get the job done and often the IS manager's capability to lead the organization through change.

That sensing isn't aided by a lot of charts. They want to hear that you understand what the business needs; they want evidence that you have some insight into how to get the job done. That's all.

Surprisingly, line executives are more convinced of the case you make by the

stories you tell—about what's going on in the industry with IT and what's going on in your own organization.

Obviously, some data is required—but not more than a few key numbers. The rest of the data should be in the backup documentation for those rare senior line managers who actually enjoy getting deep into operations and details.

### MAKING IT COUNT

But more than confirming their intuition, you should also offer line executives a way to see how IT affects their business and the means to measure those effects. Once they commit to a strategy, it's your contribution to a business result that they should be watching.

For instance, are you serving customers better? Growing the top line? Getting invoices out faster? Reducing costs? How else can you responsibly let them sense how you are doing? They can't be measuring lines of code produced—and it wouldn't matter anyway.

It seems that Oxford's top executives failed to understand that IT essentially was the HMO's product line billing and claims handling.

Oxford now gets it with a vengeance and has hired an ex-Artex operations guru who, Oxford's press release brags, once managed "service operations [that] handled \$8 million customer calls [and] paid more than \$28 billion in claims annually." I think Oxford's executives now fully understand an IT strategy. The concept has been seared into their minds. ☐

Champy is chairman of consulting at Perot Systems Corp. in Cambridge, Mass. His Internet address is [JimChampy@ps.net](mailto:JimChampy@ps.net). His newspaper columns are syndicated by Tribune Media Services.

## Less paper at the office?

Paper will continue to be a key medium for reading and communication during the next 10 to 20 years. But dead trees are giving way to electronic documents at work, according to a study commissioned by The Electronic Document Systems Foundation (EDSF) in Torrance, Calif.

The study looked at the effect that new technologies would have on reading, publishing and the use of paper documents. It cited several types of documents that in the future may be read more in electronic format than on paper.

EDSF focus groups said the most likely documents to transfer to electronic format are memos and professional letters, followed by reference material and legal documents.

The least likely documents to make the switch are novels and magazines.

"On one hand, the study confirms the shift away from traditional reading to viewing or browsing," says Keith T. Davidson, president of EDSF and Xplor International, a worldwide association of more than 2,300 organizations that develop and use electronic document technology. "Yet it also says that a literal paperless society is not imminent."

## Essays, anyone?

"American Programmer," a monthly newsletter for information technology professionals and software industry executives, will award a \$1,000 cash prize to the writer who can most effectively answer the question "What matters in IT?" in an essay on the critical issues facing IT.

The prize will be awarded at Cutter Consortium's Summit '98 conference, which will be April 27-29 in Boston. The winning essay also will be posted at the "American Programmer" World Wide Web site and editor Ed Yourdon's site for six months.

Deadline for submissions is Jan. 31. For more information, contact Laura St. Clair at (881) 641-0933 or [LStClair@cutter.com](mailto:LStClair@cutter.com). Or visit the Cutter Web site at [www.cutter.com/amprog/contest.htm](http://www.cutter.com/amprog/contest.htm).

f.y.i.

## Review Center

### Choosing an Internet service provider

# WHAT YOUR PEERS SAY

**By Kevin Burden** The pressure — ooooh the pressure! Pick the wrong Internet service provider and your Web site will sputter into obscurity, your company will look cheesy to the Web world, and the mail — that's E-mail — won't go through.

Fears such as those have sent many companies into analysis paralysis when evaluating service providers.

But experienced users say any research beyond checking customer references will turn up only negligible differences that have little impact.

One user likened Internet service provider shopping to shopping for a car — oh yeah, that makes you feel much better. Seriously, you're looking for the same attributes. Above all, you want reliability. You know there will be some scheduled maintenance, but you don't want to worry about being stuck idle for long. You want good performance — at least as much as you paid for. You want service technicians standing by when something breaks, although you don't want to become friendly. And

of course, you don't want to be ripped off.

In a Computerworld survey of 50 large user companies, 74% said cost was one of the most important criteria when choosing a service provider, far beyond any other factor.

Now hold on, Cost? As important a role as Internet service providers can potentially fill for companies, how can the decision be trusted to cost? Obviously, much more does get considered, such as reliability, security and the service provider's general reputation, but cost is what users say they see differentiating vendors. Even for customers who demand high reliability and enhanced services, when other factors are equal they turn to pricing as the breaker.

"Besides a word-of-mouth reliability study, cost is what you see," says Rick Peers, page 80

# WHAT THE EXPERTS SAY

**By Cathleen Gagne** Levels or classes of service will be the buzzwords in the Internet service provider market this year. What this will mean for user companies is they can choose from various levels of priority best suited for their Internet access patterns. And that also means companies can increase or decrease their Internet service provider costs, depending on their needs.

Computerworld spoke with senior analyst Eric Paulak at Gartner Group, Inc., in Stamford Conn., and Jennifer Bestor, vice president of research at Inverse Network Technology, Inc., which is an Internet service provider testing firm in Santa Clara, Calif. They discussed cost and the classes of service shifts, how to select a service provider and also vendor positioning.

"1998 is the year that not quality service, but classes of service get introduced," Paulak says. Classes of service, he says, mean differ-

ent levels of priority. And that also impacts the pricing structure.

He uses the Federal Express Corp. model to illustrate his point. "For example, if you have the highest priority, you're paying FedEx prices, guaranteed overnight." But the different service providers' levels of service go beyond that model. "The problem with it is . . . when you establish the different priorities of service, it's just guaranteed to get there before the next lowest level, which is guaranteed to get there before the next lower level, etc."

And service providers will use more billing and customer care systems to help track the classes of service, Paulak says. So "you can expect to pay more for more guarantees. It's the first step as we move toward a real quality of services. You have to have this in place." Compare it to a bank's automated teller machines: We pay an extra fee to get what we need now.

Consolidations of some of the major Experts, page 80

WHAT IS THE  
FUTURE OF THE  
INTERNET?  
PAGE 80



PHOTO COURTESY OF

# PEERS EXPERTS

## CONTINUED FROM PAGE 29

Kanner, chief of the network management division at the Federal Communications Commission, in Washington. "Reliability is far and above the most important thing [UUNET Technologies, Inc.] can deliver to us, but cost is how we shopped," he says.

### Simple needs

Respondents were less interested in the myriad of value-added services such as World Wide Web page hosting, audio/video streaming and news feeds. Many of the respondents characterized downtime as a mere inconvenience rather than a genuine affliction. "We lose touch with our major customers, there are no sales made, but the main impact is loss of E-mail," says Robert Loper, information systems director at Chippenhook Corp., in Flower Mound, Texas.

But what about companies that have moved beyond simply maintaining a home page to creating sites that generate revenue? Can cost still make the decision in cases where downtime is more

Haraco also formed a coherent Internet strategy that outlines everything from virus protection and firewalls to who can and can't download information. It also took another look at its Internet provider and ultimately switched to MCI Communications Corp. Haraco was already using MCI for voice, so "it made sense to work a better price by consolidating voice, data and the Internet with one carrier," Shafi says.

### Cost counts

Common sense says there is more to consider, but some users who have switched Internet service providers purely for cost reasons say they would do it again if the savings were worth it. Milligan College, in Johnson City, Tenn., dropped BBN Planet (now called GTE Internetworking after being acquired by GTE Corp. in May of last year), in favor of Sprint Communications Co. for a 20% cost cut. "We were happy with BBN Planet, but just couldn't justify that to them," says Michael Smith, director of computer services at Milligan. "We felt reliability wasn't going to be that much different for our [3,000] users, and now that we've switched, we know it's not different."

Of course, reliability — the percentage of time the connection is up — does vary among providers. And providers score well on reliability, with 88% of users giving them favorable grades in that area. But users say the differences among major service providers are too minute to waste time crunching comparatives.

"[Internet providers] all are so similar to each other. We did a lot of evaluating, but reached a point where we just signed up so we'd stop wasting our time and the suppliers' time," says Steve Keck, vice president of IS at the Donlen Corp., in Northbrook, Ill. "It came down to who offered the best price."

So users say you should get your best price in writing, then try to strike a better deal with competitors. Even though users say it's more advisable to build partnerships with suppliers rather than beat them up over price, "holding up your best price and asking if anyone can do better — that works," Keck says. □

Burden is Computerworld's feature writer. Review Center.

## CONTINUED FROM PAGE 29

providers will also continue this year. Customers can protect themselves if their Internet service provider vendor gets acquired. According to Bestor, "The way I've seen companies protect themselves in these situations is to have a 'review' clause in the service agreement stipulating that, if the vendor is acquired/merges/etc., the company has the right to review the relationship within X [usually three to six] months and terminate without penalty."

### Evaluating service providers

How should an IS manager evaluate Internet service providers? Here are some guidelines offered by experts.

Puskas offers the following advice on the big picture:

- To avoid building redundant networks, look for an Internet service provider that can link your existing data networking services with your Internet services. So 95% of the time, you're probably going to pick the company that is providing your data networking.
- Look at a company that is offering guarantees on its quality of service. If it doesn't offer a guarantee, you don't have to bother evaluating it any further

- Look at a company that has multiple access technologies and methodologies — one that can give you frame-relay access and traditional access.

Bestor offers questions to ask yourself and the Internet service provider before choosing:

- What is your required bandwidth? (It can range from Integrated Services Digital Network to fractional T1 or frame relay to T1 to T3.)
- What is your installation time frame? (Often this is subject to the local telephone company, but some providers use competitive access providers that can chop the wait.)
- Do I tell the provider when I'm down... or does it tell me?
- What if I find a problem with a network other than the Internet service provider? Does the service provider have a resolution mechanism?
- Do I get a 24-hour page number?
- Does the provider give monthly usage reports? Online reports?
- Does the Internet provider offer a redundant ISDN backup link? □

Gagne is Computerworld's senior editor, Review Center.

How many hours per month are you unable to connect to your Internet service provider?

Survey results of 100 respondents who have been unable to connect for more than 1 hour of downtime per month.

Less than 1 hour 64%  
Between 1-4 hours 20%  
Between 4-8 hours 8%  
Between 8-16 hours 4%  
More than 16 hours 4%

Source: Computerworld, Jan. 26, 1998

How satisfied are you with your Internet service provider?

Survey results of 100 respondents who have been unable to connect for more than 1 hour of downtime per month.

by vendor, but collectively satisfaction is high.

Performance	Good	Very good
Reliability	64%	28%
Quality services	62%	40%
Security of technical support	54%	42%
Responsiveness to service requests	28%	48%
Pricing	34%	64%
Overall satisfaction	18%	70%

Source: Computerworld, Jan. 26, 1998

than a nuisance? It isn't the most important factor, but it influences the decision.

Haraco Corp., an industrial products manufacturer in Camp Hill, Pa., chose PSINet, Inc. two years ago largely on price. "We didn't use the Internet as critical to us then. PSINet gave us the best price, so we went with them," says Sohail Shafi, director of information technology.

But since deciding to Web-enable applications and electronic catalogs, Haraco's priorities have changed. Availability, quality of service and performance now rule, according to Shafi.

## Provider market position

Here's an analyst's look at service providers from the viewpoint of a large commercial organization. Garbar's Puskas comments on each vendor's position in the market.

### AT&T's WorldNet Service

[www.att.com](http://www.att.com)

Targeted toward midsize enterprises. Template approach. Not much customization.

### GTE Internetworking

(formerly BBN Planet Corp.)

[www.gte.net](http://www.gte.net)

High-end marketplace for both Internet access, security and Web hosting. Leader in the market.

### MCI Internet

[www.mci2000.com](http://www.mci2000.com)

Primary wholesale provider. Mass business market for templates and other services. Limited on customization.

### NetCom On-Line Communication Services, Inc.

[www.netcom.com](http://www.netcom.com)

Primarily a consumer provider. No. 1 in business dial-up services.

### PSINet, Inc.

[psinet.com](http://psinet.com)

Leader in midmarket services. Also an innovator in terms of virtual private networking for midsize businesses.

### Sprint Internet Services

[www.sprint.net](http://www.sprint.net)

Focuses strictly on access services. Very good worldwide global coverage.

### UUNET Technologies, Inc.

[www.uunet.net](http://www.uunet.net)

Big. Focuses on customized network design solutions. Good in transaction-processing Web sites. Fairly poor in support.

### IBM Internet Connection

[www.ibm.net](http://www.ibm.net)

Big. Focuses on customized network design solutions. Good in transaction-processing Web sites. Fairly poor in support.

### Digex, Inc.

[www.digex.net](http://www.digex.net)

Best up-and-comer. Very competitive in Web hosting and in Internet access services, now combined with traditional networking services.

### AMS Communications, Inc.

[www.ams.net](http://www.ams.net)

High-end Web sites for publishing companies. Leader in bringing remote access to the Internet.

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# Next Time is now?

A review by Computerworld and Client/Server Labs indicates that Windows NT Enterprise Edition can whet the appetite of demanding users

BY MICHAEL HAYES

Microsoft's Windows NT is moving beyond its nicknames of "Nice Try" and "Not There." But it still carries a certain feeling of "Next Time" about using NT to support the enterprisewide operations of some larger organizations. With the release of Windows NT Server 4.0 Enterprise Edition, "Next Time" may be here for many of the holdouts and close on the horizon for others.

To get a view of what this newest release of NT brings, Computerworld hired Client/Server Labs, in Atlanta, to run the Enterprise Edition around the track. We found that NT Server 4.0 Enterprise

Edition is well-positioned for much of its intended marketplace, but it has enough rough edges that early adopters will need to be well-prepared. For example, selecting appropriately certified hard-

ware has become vastly more important with this release because of its clustering capabilities, and it is still somewhat troublesome to determine which manager application controls particular services.

The Enterprise Edition adds clustering, message queuing, support for more than four processors and adjustable memory configuration to the familiar features of NT Server 4.0. Microsoft has clearly targeted those new features at users for whom high availability or raw power are issues.

## Two pillars

In Microsoft's view, there are two key areas that the Enterprise Edition addresses: scalability and high availability. We set out to specifically exercise the high-availability features and take a more theoretical look at the scalability enhancements.

## Scalability

Two significant improvements have been made in Enterprise Edition in support of server scalability. The first and most straightforward change in the product is the extension of support for symmetrical multiprocessing (SMP) to a maximum of eight CPUs in the end-user version. OEMs will be able to provide the product bundled on their systems with SMP support for configurations up to 32 processors.

Enterprise Edition has the same 4G-byte memory limit as the Standard Edition. But Microsoft's second improvement is the addition of a feature called 4G-byte RAM tuning, which enables the administrator to change the memory allocation on a large system. Instead of the standard division



into 2G bytes for the operating system and 2G bytes for applications, the administrator can let the applications use up to 4G bytes of memory. Although this feature is not dynamic and must be configured prior to start-up, it does permit major applications (such as a heavily used database) to use significantly more memory.

## High availability

Here also, Microsoft has made two key additions with Enterprise Edition, Cluster Server and Message Queue Server.

The most immediately interesting is Cluster Server, which allows the administrator to connect two computers to a shared set of disk drives, and then define various resources (disks, applications, services and so on) as being shared between the two servers.

Once configured, this scheme allows one of the two servers to host a particular function on the network, while the other server is able to take over the defined task if the first server fails. Client systems that send TCP/IP requests to an IP address shared between the two halves of the cluster see only a brief period of nonresponsiveness (in our testing, as low as 25

Next Time, page 84

## Test platform

You have to be careful when selecting the hardware for NT Server 4.0 Enterprise Edition. One of the key high-availability features of the product is support for clustering, so it's important to select hardware that is certified for use with the product's Clustering Server.

We tested Enterprise Edition on a cluster composed of two Hewlett-Packard Co. NetServer LXE Pro computers with a shared disk system of two Storage System 6 arrays.

The servers had dual 200-MHz Pentium Pro processors, 256M bytes of memory, 8G bytes of internal disk storage and 16G bytes of storage in the shared disk system.

The shared disks were connected to both servers via dual-channel SCSI connectors, using a cluster-specific array controller.

Also included in the test bed was an HP NetServer E 40 running the standard edition of NT Server 4.0 and used as a primary domain controller for the two units in the cluster.



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# Next Time

CONTINUED FROM PAGE 22

seconds or as high as 60 seconds) and lose at most the most recent data packet, which is quickly recovered by a retransmission.

Our cluster consisted of one active server that hosted the services actually in use and one passive server that was essentially idle until called upon. However, the same hardware could have been configured to allow each server to actively host services while standing ready to take over the services of the other should it fail. That capability allows an administrator to perform some rudimentary static load balancing.

The Cluster Administrator program, which can be run from the cluster servers themselves or from any NT workstation on the network, was impressive in its combination of simplicity and function.

Although the present version supports only clusters of two servers, the administration utility is clearly designed with the promise of multiver clusters in mind.

The familiar tree-structured presentation of other Microsoft utilities is carried through here, making it easy to comprehend. We ran into some mysterious confusion because the resource items appear in more than one place in the tree at the same time.

Two major drawbacks to the Cluster Server appeared in our testing. The first was a limitation in the boot process imposed by an oddity in the hardware used for testing. Because the cross-connections for the shared SCSI array used active termination (drawing their termination from a powered circuit on the SCSI adapters) the system could be started only with a fairly complex process that required manual intervention by an operator. That is by no means common to all of the clustered systems available for Enterprise Edition, but it pointed out the need to carefully select hardware for a clustered environment. If unattended restart from a complete failure of both nodes were a requirement, we would have had to use different hardware.

## Trouble

The other drawback was more subtle and ultimately more troubling. Any of the applications or services that could be defined as shared under the Cluster Server could, of course, be used as stand-alone applications or services in a nonclustered environment. So they all have administration utilities of their own, even if only the familiar NT Services list. However, we discovered in several cases that, if the administrator forgot that a service was shared across the cluster and used the "normal" administration routines (instead of the Cluster Administrator) to stop a service, problems would ensue. In some cases, the Cluster Administrator would see the stoppage as a failure of the ser-

vice and move that service with all its related resources to the control of the other server. In others, the Cluster Administrator would attempt to restart the service, causing the system to become confused. In those cases, a shutdown and restart of the entire server was the only way we found to clear the problem.

The second element of the high-availability enhancements is the Message Queue Server, designed to keep applications running even when communications are delayed or broken. Unlike clustering, which benefits any TCP/IP-connected client application, using Message Queue Server requires special software loaded at the server and on each client station. Once set up, the client sends requests to a receiving queue on the server. If the server to which the message is being directed isn't responding, the special software on the client system "queues" the messages, allowing the application which generated the request to continue processing without waiting for the message to be sent.

An example set of applications, shipped with Enterprise Edition, illustrates the concept nicely. An application running on a client sends stuck trade requests to a server. An application running on the server receives those requests and enters them into a database for execution. If the server stops running for any other problem, such as a network outage, interrupts communication, the Message Queue software on the client begins storing the trade requests from the application. When the server is again available, the client and server pieces of the Message Queue software establish contact and the stored messages are delivered and

processed.

Message Queuing may be used independently of clustering, based on the needs of the environment. Without clustering, queued messages are held until the failed server or connection is restored. In a clustered environment, messages flow again as soon as responsibility for the Message Queue has been transferred from one server to the other. In our testing with Message Queuing in a clustered environment, the time from a failure of one server until queued messages resumed flowing to the other server never exceeded two minutes.

## Adoption plans

The decision of an organization to adopt NT Server 4.0 Enterprise Edition as a strategic platform for the applications on which they bet their livelihood seems likely to depend on two factors: availability needs and NT itself. A prime issue will be whether they require the high availability of elements such as Cluster Server and Message Queue Server, or the brute power of lots of CPUs and memory.



NT's performance monitor tracks the activity on each CPU in the cluster

But a gating factor will be how desirable users view NT Server itself. In its present incarnation, Enterprise Edition doesn't seem likely to woo many users away from existing Unix clusters or other high-end solutions already in place.

It will, however, be very attractive to organizations that already have significant NT presence and whose appetite for power and dependability is growing beyond the standard offering.

It also may well become a choice for those who haven't committed yet. □

Hayes is a systems control manager at Client/Server Labs, a primary test lab partner of Computerworld. He can be reached at [hayes@cslc.com](mailto:hayes@cslc.com).

## In Depth

# Techno TEENS

BY CATHLEEN GAGNE

An early  
scouting  
report on  
some of  
tomorrow's  
IS leaders

The baby boomers' offspring are coming! And they reach for their computers as naturally as most of us reach for that first cup of coffee in the morning. *Computerworld* talked to five high school students, members of the 'net Generation who won the Iomega Zip Techno Whiz Kids contest for their achievements in technology.

More than 500 U.S. teen-agers ages 14 to 18 entered the contest. Sponsor Iomega Corp. winnowed the pack to 10, who were then put through their paces in telephone interviews.

The five winners were given a suite of Iomega drives and a trip to Comdex/Fall '97 in Las Vegas.

Hey, to a teen-ager, that's fun!<sup>□</sup>

Gagne is *Computerworld's* senior editor, Review Center. Her Internet address is [cathy.gagne@cw.com](mailto:cathy.gagne@cw.com).

## RORY LOEB

AGE: 15

HIGH SCHOOL: Homestead, Sunnyvale, Calif.

COLLEGE PLANS: California Polytechnic State University

DREAM JOB: Automotive design

COOLEST COMPUTER GAMES: Carmageddon, Redneck Rampage

WHIZ KID WINNER: For sharing his knowledge of technology with students and teachers



## Helping hand

Rory Loeb goes to the same high school that Steve Jobs attended, jobs is the person Loeb looks up to most in the technology sector. "I admire his integrity, how much he pursued Apple and how far he got the company to go," he says.

And, perhaps because he grew up in the heart of Silicon Valley, Loeb's technical talents flourished early. "He loved computers since he was 4," his mother says.

On the other hand, how many teen-agers can call themselves computer systems administrators? At Loeb's school, the answer is 15. Loeb and those classmates get grades rather than salaries for fixing Macintoshes, PCs and software. The students even teach their teachers how to use computers or anything else

that is requested. "We do it on our own free time, and we get graded on it," he says. "It's like a class."

Loeb says his school is fairly up to date with its handful of Macintoshes that run at 250 MHz and other Macintoshes and PCs that run at 150 MHz or lower processing power. But he would like to see more Macintoshes at the high end. On his wish list: "That each student could have their own laptop. Instead of having to handwrite assignments, they would write them up and E-mail them to the teacher. We'd become an entirely paperless society."

Well, not entirely. Loeb's other favorite hobby is three-dimensional modeling with paper. "I do modern houses, really detailed," he says. "I use poster board and paper."

shooter  
Trouble



# Techno TEENS

CONTINUED FROM PAGE 85

**Ravi SARIN**

**AGE:** 16

**HIGH SCHOOL:** Harvard West Lake, North Hollywood, Calif.

**GRADE:** 11

**COLLEGE PLANS:** Undecided

**DREAM JOB:** Running own business

**COMPUTER HERO:** Michael Dell

**WHY? KID WINNER:** For creating an online volunteer center and running an Internet consulting business



## Reaching out

Ravi Sarin was born an entrepreneur, according to his mother. "When he was in kindergarten, he asked for baseball and basketball cards for his birthday and Christmas presents," says Anna Yang, his mother. "He made it into a collection and was able to buy and sell and trade out of it. His whole hobby was totally free."

Today, Sarin not only operates an Internet consulting firm in which he creates Web sites for companies, but he also runs his own site that gives awards of excellence to other sites. "We call it 'Web's Elite Award,'" says Mom.

"Imagine a 13-year-old giving them an award, and they'd be so proud. In turn, to get a Web."

But most notable about Sarin is his big heart: He and his sister last year created a site ([www.reachout.org](http://www.reachout.org)) including all nonprofits organizations in the Los Angeles area that need volunteers.

"A lot of people like to volunteer, but it's hard to go directly to a volunteer center," Sarin says. "The Web site is something anyone can use."

He's trying to get others involved to expand the concept to other cities, such as Seattle and Providence, R.I.

## Knowledge sharing



## Web savvy

**JULIA WYMORE**

**AGE:** 16

**HIGH SCHOOL:** Washington, Cedar Rapids, Iowa

**GRADE:** 11

**COLLEGE PLANS:** University of Oregon, then the National School of Naturopathic Medicine in Portland, Ore., for an ND (naturopathic doctor) degree

**DREAM JOB:** Naturopathic doctor

**FAVORITE CLASSES:** Russian, music

**WHY? KID WINNER:** For creating her own Web site and launching a business on the Internet



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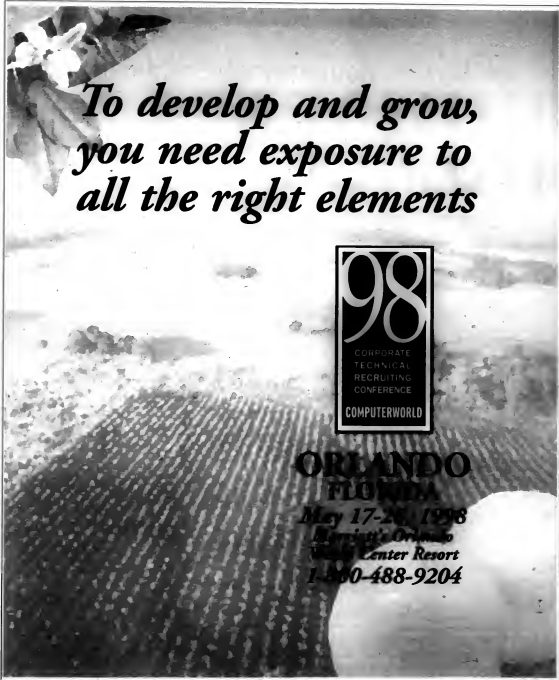
Sound like a late-night television commercial? It's a line from Julia Wymore's organic lip balm Web site — a '90s version of a roadside lemonade stand.

Inexperienced in computers until the beginning of last summer, Wymore was selling her lip goo (made from beeswax, organic rice syrup and natural flavoring) to friends at school. She hit the 'net to reach a broader audience.

"We got her a computer, and she just ran with it," says Greg Wymore, her father. "She spent the summer teaching herself."

Wymore created her Web page by downloading a free Hypertext Markup Language program from America Online, Inc. "I pretty much figured it out," she says. "It wasn't like I had to make things up myself."

While her heart's desire lies in naturopathic medicine rather than technology, Wymore's entrepreneurial spirit and technical aptitude may help pay those hefty college bills. She expects her business to become profitable in a couple of months.



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# The NUMBERS

By Rochelle Garner & David Weldon

Labor crisis or skills shortage? *Computerworld* examines the alarming projections of IT supply and demand

**T**hey say numbers don't lie. And on the face of it, the numbers are downright dire.

This year alone, 346,000 IT-related jobs will remain unfilled, says the Information Technology Association of America (ITAA).

The demand for trained workers is increasing by 95,000 IT jobs per year, according to the U.S. Bureau of Labor Statistics. And between 1994 and 2005, U.S. businesses will generate a demand for more than 1.3 million additional information technology professionals, says the Labor Bureau.

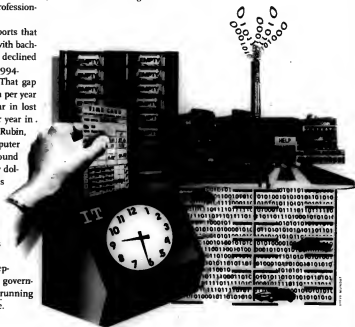
The Department of Education reports that the number of students graduating with bachelor's degrees in computer science declined more than 40% between 1986 and 1994.

Now comes the truly scary part: That gap will cost U.S. businesses \$500 billion per year in lost revenue, \$10 billion per year in lost business income and \$15 billion per year in compensation, according to Howard Rubin, a consultant and chairman of computer science at Hunter College, in Pound Ridge, N.Y. That's because, for every dollar spent on information systems salaries, a company can expect to generate \$43 in revenue, he says. Under that assumption, a company could lose \$2.4 million per year for each IS pro it can't hire, Rubin's math suggests.

Gee, no wonder so many people representing the state and the federal governments and the IT industry are running around like extras in a disaster movie.

## Game

There is just one problem: This particular set may be built on a foundation of flawed assumptions, presumptions, old or incomplete data and extreme leaps of faith. Which isn't to say that the skills shortage isn't real — it is, by all accounts. But this future blockbuster could turn into a major bust. That's why it pays to examine just where these folks get their numbers.



## SPECIAL REPORT THE IT WORKFORCE

## IT demand for jobs vs. supply of workers

Let's start with the ITAA figures that show workforce demand. The ITAA is the political lobbying association that represents 11,000 technology businesses. Its 1997 report, "The IT Workforce Gap at the Dawn of a New Century," says companies face a 190,000-person shortfall in the IT field. Since the report was released, the ITAA has doubled that figure to 346,000 in its updated study, "Help Wanted: A Call for Collaborative Action for the New Millennium," prepared by Virginia Polytechnic Institute and State University.

The report received immediate attention and was cited by news organizations around the country earlier this month. Suddenly, the heads of the U.S. departments of labor, commerce and education were being summoned to speak before journalists on the growing "crisis."

How did the ITAA get its numbers? In 1997, it sent out 2,000 surveys to a random selection of its members and collated 271 responses. And for the new study, Virginia Polytechnic conducted telephone interviews with 554 IT vendor and IT user companies.

The return rate or survey base isn't statistically suspect in either report, but the way the ITAA expanded the results to represent 101,607 technology and non-technology companies is. Both polls represent no more than one-half of 1% of IT organizations, according to ITAA numbers. And if at the surveyed companies the IT staffs were small overall, the num-

## Projected JOB VACANCIES in the IT workforce

	Feb. 1997	Jan. 1998
Job titles surveyed	3 core titles*	3 core titles*
Job vacancies	70,000	346,000
% of IT workforce	10%	10%
Expected growth in vacancies	25,000	95,000

\*Only job titles surveyed include systems analyst, computer programmer/analyst and computer programmer.

Source: ITAA special reports

## Projected JOB GROWTH in the IT workforce

Job title	1994 workforce	Jan. 1998	% growth
Computer programmer	537,000	601,000	12%
Computer systems/analyst	545,000	653,000	20%
Systems analysts	483,000	928,000	92%
TOTALS	1,565,000	2,184,000	34%

Source: U.S. Department of Labor, Bureau of Labor Statistics

## Projected SHIFTS in the IT workforce

Nature of employment	1997 workforce	2002 workforce	% change
Permanent employees	70%	50%	-20%
Contract professionals	30%	50%	+20%

Source: American Technology Staffing report

ber of "core IT" jobs ITAA is tracking would be small. Job vacancies that show up would appear to be very high vacancy

rates and would be projected outward to represent the entire IT workforce.

And the Labor Bureau's belief that

U.S. businesses will crave more than 1 million computer engineers, systems analysts and computer programmers by 2002? That seems more likely, considering the bureau's ability to rigorously measure nearly everything under the U.S. sun. But there's a catch: The labor group gleaned its data by polling the nation's private and public sector for projected growth at a time when the U.S. economy and IT industry have never been stronger.

Now consider a similar study reported in 1993 by the National Science Foundation's Ad Hoc Working Group on science, engineering and mathematics professionals. The report's conclusion: "It is not entirely possible, and will probably never be possible, to predict with a high degree of accuracy... shortages or surpluses of scientists and engineers several years into the future. Limitations on projections are especially severe for demand, since demand is a function of the economic cycle and of global events that are difficult, if not impossible, to predict."

Clearly, there's a presumption that this unprecedented growth will continue unchecked. But things change, as evidenced by the seemingly unstoppable downsizing in the early 1990s. That's the premise behind the criticisms leveled by the American Engineering Association and Institute of Electrical and Electronics Engineers, Inc. (IEEE). Both groups charge the ITAA with the political agenda of convincing the government to eliminate the 65,000-person cap on H-1B visas for qualified foreign labor.

## Foreign labor

## Foreign national workers

• 65,000 foreign national professionals can be sponsored by U.S. companies each year.

• The annual cap of 65,000 H-1B visas was reached for the first time Aug. 25, 1997.

above crisis or not, companies are experiencing a serious skills shortage. That explains why the ITAA is so hot on its campaign to increase the number of H-1B work visas issued to skilled foreign nationals.

"We have made this our No. 1 priority," Susan Marshall, ITAA's vice president of information services, told the San Jose Mercury News.

## Salaries

One thing is certain, though: Salary and compensation costs are on the rise. How high they'll rise is open to debate. Computerworld's latest annual salary survey

indicates annual salary increases averaging 9% for IT professionals. The ITAA maintains that salaries are increasing by 20% to 25%. How to explain the discrepancy?

One way might be to examine who exactly is being polled. Computerworld, for

example, primarily surveys the users of technology (such as corporate IT professionals), not providers of technology products and services (such as vendor IT professionals, contractors and consultants). The ITAA's constituency is technology business.

## Changes in IT salaries for select job titles

Title	1995	1996	1997	Change
CIO/VP of IS	\$91,600	\$96,400	\$123,100	34%
Computer operations manager	\$40,800	\$39,600	\$38,500	-12%
LAM manager	\$44,800	\$46,900	\$52,600	12%
Systems analyst	\$45,000	\$44,500	\$51,600	12%
Network administrator	\$42,800	\$44,600	\$47,400	11%
Programmer/analyst	\$37,200	\$36,000	\$43,000	10%
PC tech support specialist	\$33,000	\$34,200	\$34,100	3%
Computer operator	\$21,400	\$20,500	\$27,300	7%

Source: Computerworld's Annual Salary Survey (1995, 1996, 1997)

## The scoop on IT salaries

• Gartner Group says base salaries for two-thirds of IT jobs will increase between 25% and 30% by 2002.

• William H. Sharer says average hourly compensation for software architects and consultants rose nearly 20% in 1996.

• Deloitte & Touche Consulting Group says salaries for computer network professionals rose an average of 7.4% from 1996 to 1997.

• Capgemini & Informal LLP says the average pay increase in the software industry was 6.5% in 1996.









## SPECIAL REPORT THE IT WORKFORCE

CONTINUED FROM PAGE 89

## Rising enrollments in IT degree programs

**N**ow examine the gap between supply and demand. According to the U.S. Department of Education, the number of bachelor's degrees in computer science dropped 40% from 1986 to 1994.

"We have no reason to believe that trend will change," says John Sargent, co-author of the Department of Commerce's report, "America's New Deficit."

Perhaps. And yet, when you combine the number of bachelor's degrees with the number of master's degrees and doctorates awarded, the overall decline has been only 46%. What's more, this trend statistically began to increase in 1993 and has increased every year since.

## SUPPORTING EVIDENCE

Anecdotal evidence also indicates that IT enrollments have been rising dramatically over the past two years.

Universities around the country began to report sizable jumps in computer science department enrollments. Some of the leading IT colleges say their IT enrollments are up 25% to 40% this year.

And principal academic speakers at the ITAA's national workforce convocation on Jan. 12-13 took issue with the claim of declining enrollments. Confirming that IT enrollments have skyrocketed were Dr. Stuart Lynn from the University of California at Berkeley, Norman Matloff from the University of California at Davis and Dr. Graham Spanier from Penn State University, in University Park, Pa.

By itself, the measure of computer science graduates is an easy yardstick that signifies little. Universities now

## Computer science degrees awarded

Degree	1987	1988	1989	1990	1991	1992	1993	1994	1995
Bachelor's	29,927	NA	30,563	27,645	25,410	24,854	24,477	24,465	24,662
Master's	8,401	NA	9,399	9,643	9,324	9,530	10,367	10,421	10,332
Doctorate	374	NA	536	623	676	772	805	810	884
TOTALS	48,702	NA	40,898	37,891	35,410	35,156	35,449	35,696	35,878

Source: National Science Foundation

## Other IT-related degrees being awarded

## Schools surveyed by Computerworld

1. MIT
2. University of Texas
3. Carnegie Mellon University
4. University of Minnesota
5. University of Michigan
6. University of Illinois at Urbana-Champaign
7. University of Arizona
8. University of Pennsylvania
9. University of California at Berkeley
10. New York University

\*Computerworld's survey of the above schools found 24 noncomputer science and 17 research degrees.

offer as many as two dozen different IT-related degrees — from management information systems and library science, to software quality.

Computerworld contacted two of the leading IT university programs and found 24 noncomputer science — but IT-related — degrees being offered.

Equally important, most current IT workers earned their degrees in unrelated

## Sample of IT degrees\*

- Management of Technology program
- Doctorate in management with a concentration in IT
- Techno MBA with several areas of concentration possible
- MIS/information science degree
- Information networking degree
- MBA in computers and information systems
- Software engineering (graduate level)
- MBA with concentration in technological innovation decision processes
- Telecommunications and networking (master's degree)
- Jerome Fisher Program in Management and Technology

ed fields, such as business or even psychology. According to the National Science Foundation, only 29% of all computer scientists, systems analysts and programmers now working actually received a degree in computer science. A full 35% earned bachelor's degrees in engineering or other natural sciences.

Other IT professionals received de-

grees in liberal arts or other fields, and many others have no science-related degrees.

"The ITAA and Commerce Department wanted evidence to support the panic that terrible things are going on," says Cliff Adelman, a senior research analyst at the Department of Education. "Lots of people graduate in fields other than computer science."

## Training

**A**ccording to the IEEE, the answer to the skills shortage lies in the ready pool of retirees and laid-off workers who can learn information technologies fast.

"Last year saw 380,000 corporate jobs cut," says Shankar Lakshmin, chairman of the IEEE Workforce Committee. "Let's say, for the sake of argument, that 15% of those people were technical, or at least possess a logical mind. That's 57,000 people a year who can be trained easily and rapidly in IT."

That's trained in-house, of course. Once again, the ITAA has figures, only this time it cites a National Association of Manufacturers report. The report's

## Spending for IT training

Year	IT budget spent
1996	7.2%
1997	9.5%

## How IT training budgets are spent

75% technical training
25% soft-skills training

Source: International Data Group, Framingham, Mass.

conclusion: U.S. companies spend more than \$40 billion per year on workforce training.

There seems to be no disagreement that this training spending will increase dramatically.

## Conclusion

**S**till, no matter how you slice it, IT workers are moving on at 25% turnover rates — or worse. They leave for better pay and better working conditions. Dominique Black, CEO of Advanced Technology Staffing, in Redwood Shores, Calif., says many IT workers have gone independent.

"We estimate that 800,000 of the total 2.5 million IT workforce are contract workers," Black says. "No one really knows, because no one tracks that information at a sufficient level of detail. We are moving to a free-agent nation."

Many employers consider jobs filled

by contractors as "vacancies," a fact confirmed by participants at this month's ITAA convocation.

What do these numbers mean? The only sure answer is that the nation's IT workforce is changing so fast it will soon be unrecognizable. Whether we are on the cusp of a crisis, at a dramatic transformation or something in between will be explored next week. □

Garner is a freelance writer in San Carlos, Calif. Weldon is Computerworld's senior editor. IT Careers. Computerworld research staff: Joseph Rigels, Mari Kofe and Laura Hunt contributed to this report.

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#### Software Programmer Analyst

- Provide on-going analysis, design and coding of complex IBM mainframe software systems using COBOL, C, and/or Assembler
- Implement innovative software solutions using full life-cycle development

#### Integration & Test Analyst

- Develop and explain test plans and case documents based on user requirements
- Generate test data using IBM and Tandem systems
- Set up test ICL job streams, and use DB2 and MVS utilities to set up and display test data

#### Programmer Analyst

- Analyze and design of complex applications using Easytrieve Plus, SAS, and JCL

### SUPPORT

#### Communications Specialist

- Prepare detailed Local and Wide Area Network requirements and design plans. Provide testing, troubleshooting and implementation
- Requires data and telecommunications experience LAN, WAN, SNA and VTAM

#### Data Center Technical Support

- Analyze, code, review and modify JCL, PROCs and other JCL components
- Provide technical documentation, and ensure Data Center standards, procedures and guidelines are adhered to

### SYSTEMS

#### Database Administrator

- Support a 2+ terabyte "mission critical" DB2 database in a main environment
- Evaluate system performance & ensure database integrity

#### Systems Programmer

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- Manage the multi-system MVS computer software and mainframe hardware environment

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#### Technical Project Leader

- Lead logical and/or physical database design of large, complex applications
- Work with coordinate design with Database Administration, Software Developers and end users
- Experience in IBM MVS/TSO, JCL, PROCs and IBM updates required

#### Tandem Software Programmer

- Develop software applications to perform custom processing of consumer credit information for major financial institutions
- Design and code software on the Tandem platform using COBOL and C

#### Technical Consultant

- Participate in the telecommunications aspects of strategic company projects and initiatives
- Work with large multi platforms and multi-protocol networks, including the design of LAN/WAN hardware gateways, switches, and routers

#### Project Analyst

- Work with sales force to support customers who utilize Eagan's design
- Requires strong background in programming and analytical studies (SAS, TSO, JCL)

#### Systems Administrator

- Systems configuration of Tandem and IBM computers, including planning and implementing hardware and software upgrades
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• S.W.I.F.T. Inc., Human Resources, PO Box 2005, Columbia, MD 21201, USA,  
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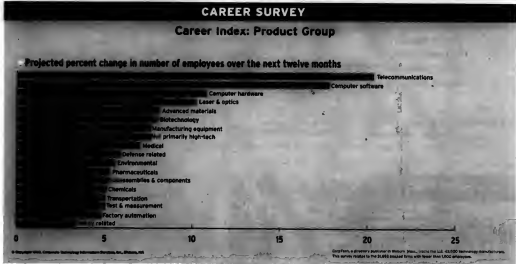
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# The Week in Stocks

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## Losers



PERCENT		DOLLAR	
Yahoo!	26.9	United Tech.	7.31
Comcast Software Inc.	25.2	NetScout	4.53
Western Digital Inc.	19.2	System Software Asian	-0.88
Western Digital Inc.	17.9	System Software Asian	-0.88
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## INDUSTRY ALMANAC

### FileNet gets back in the game

FileNet Corp.'s stock plummeted last year after the company warned of an earnings shortfall. The stock lost a third of its value in one day and continued to sink, dropping from around \$50 per share to a 52-week low of around \$10 late last spring.

But the stock price of the Costa Mesa, Calif.-based imaging, workflow and integrated document management company has come full circle. Its shares are again selling at about \$50 per share, buoyed by an expected fourth-quarter net income of \$5.8 million, well above its year-ago profit of \$5.1 million.

Analysts say FileNet's problems stemmed in large part from difficulties the company faced after buying Sova Corp., a document management company, in 1996 and Watermark Software, Inc., in Burlington Mass., a document imaging software company, which it bought six months earlier. FileNet had trouble integrating product lines, and marketing efforts were hindered by a 70-page product pricing book that "was very hard to understand," says David Hiltz, an equity analyst at Friedman, Billings, Ramsey Group, Inc., in Arlington, Va.

The company, which expects to report \$49 million in revenue for last year, invested heavily in research and development — about \$40 million last year — to simplify its product line and integrate formats, Hiltz says. This month, FileNet unveiled a consolidated product line that reduced 300 products to 30. The pricing book is now 15 pages.

Analysts credit Lou Roberts, FileNet's president and chief operating officer. Roberts, who was hired last spring, previously was general manager and vice president of worldwide marketing and sales at IBM's Networking Division.

"People were perplexed why it was taking them so long to turn around, and it left the aura the problems were intractable when in fact the addition of an outside manager was precisely what was needed... to get the company back on track," says Robert Kugel, an equity analyst at First Albany Corp., an Albany, N.Y.-based investment bank. — Patrick Thibodeau

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## MOVING ON UP

FileNet's stock price has come full circle since January 1997



KEY: 1% = New annual high reached in period; 1% = New annual low reached in period

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## COMMENTARY

## Cheap hardware boosts network computers

Dan Gillmor

**W**hen I attend technology trade shows and conferences, I haul along my notebook computer. But if someone were to steal it, I could still get my work done — albeit a little less easily than I would prefer. This tells me that the much-

maligned notion of the network computer still makes plenty of sense.

At most shows, it's common for vendors to set up elaborate public networks, often right on the show floor, complete with computers — some of them actual diskless network computers — running Web browsers, office suites and other applications. As you may have found at a trade show yourself, it's simple enough to check E-mail and keep in touch with current events in both your company and the larger world.

Whereas it was an absolute necessity to carry a computer to such events only a couple of years ago, the growing ubiquity of networked machines — and the fact that they run on powerful but simple (for users, at any rate) networks — demonstrates the potential of the net-

work computer.

Moreover, as the price of hardware continues to plunge, I'm convinced we're on the cusp of something profound: the creation of cheap but capable computing devices that do one or two things extremely well. These new devices will work right out of the box and won't crash.

Here's: Actually, that applies to most of the computers in use today. But these tend to be embedded microcontrollers in other devices, such as your car, microwave and television.

Another class of device, designed sole-

ly to provide information, also fits this category. Working right out of the box and not crashing describes precisely how my digital watch, PalmPilot and telephone behave.

Many have laughed off the network computer by pointing out that Intel-powered computers running Windows are also getting very cheap. For all the drop in capital cost of the WinTel machines, however, the overall cost of ownership remains far too high for information systems managers' tastes. Intel and Microsoft are working on this, but it's still the most significant opportunity for the network computer and other devices.

Public terminals are a natural immediate market. I look forward to the day when public terminals are in hotel rooms and on the backs of airplane seats. Imagine sending users on the road not with a laptop but with a small hard disk and authentication device. In the corporation, the major hurdles

will be cost, as always, and something more prosaic: desk space. Even the latter isn't as big a problem as it may sound, given how quickly devices are getting smaller.

The stumbling block today isn't hardware. It's software. PCs are troublesome not solely because operating systems are still too clumsy but also because vendors would rather add features than make their products bulletproof; they figure (correctly, so far) that IS will put up with the trade-offs.

Consider what will happen when hardware is cheap enough that you could have multiple devices doing specific tasks: maybe then the software companies will focus on creating devices that work every time and are stable.

IS departments should be screaming for those sorts of devices. Then IS could focus on what really matters — connecting staff, suppliers and customers; adding intelligence to tasks and products; and in general fulfilling the promise of the Information Age. □

Gillmor is computing editor at The San Jose Mercury News. His Internet address is dgillmor@mercury.com.

## With enemies like these . . .

David Moschella

**F**or an industry that likes to think it attracts the best and brightest, information technology vendors sure have done a lot of dumb things. That admittedly harsh conclusion became unavoidable after I compiled the following selection of the 10 decisions IT

vendors have made that most helped create today's all-powerful Microsoft. The list was inspired by cable company Tele-Communications, Inc.'s (TCI) recent decision to make Windows CE a big part of its cable set-top plans.

The disasters are provided in rough chronological order. If you would like to suggest a replacement or pick a favorite, let me know.

1. IBM doesn't acquire DOS from Microsoft; it licenses it. We'll never know how things might have turned out if IBM had just written a nice fat check to young Mr. Gates.

2. When IBM and Microsoft part company, IBM goes with OS/2 and Microsoft takes Windows. Perhaps the most one-sided deal since the Indians sold Manhattan.

3. Lotus gets all excited about OS/2, 9370s, VAGs . . . and seemingly anything but spreadsheets for Windows. Ditto the late WordPerfect Corp.

4. Apple has a great graphical interface five years before Microsoft, but chooses to use it to help sell hardware.

5. Despite a decade of X/Open, Unix International and Open Software Foundations, a true Unix standard never emerges; this gives Microsoft a lifetime to make something useful out of NT.

6. Although a network-centric era is fast approaching, Novell all but stops de-

veloping NetWare, embarking on a hopeless crusade to reclaim the PC software market.

7. On the verge of an all-out battle against Microsoft, tiny Netscape buys Collabra, effectively declaring war on IBM/Lotus and Novell as well.

8. Knowing that Netscape is perhaps their last chance to rein in Microsoft's software power, IBM/Lotus, Novell, Sun and Oracle essentially do nothing significant to help.

9. Having been burned by Apple's Newton, Go and General Magic, major IT companies all but abandon the handheld business, leaving the field to Microsoft at the very moment the products start to catch on.

10. Despite being fully aware of the risks, TCI, the nation's leading cable firm, endorses Windows CE, while saying it has a strategy to keep Microsoft's power in check. Right.

With enemies like these, it's no won-

der Microsoft doesn't feel the need for many friends. No matter how firmly I believe that Microsoft has engaged in some improper tactics, there's no disputing the fact that Microsoft's competitors have often caused their own ruin.

As Oracle, America Online, Intuit and Lotus (with Notes) have shown, it's possible to successfully compete with Redmond. But you can't do it by making fundamentally bad business decisions. Even after recognizing that hindsight is always 20/20, it still seems clear that there was nothing inevitable about Microsoft's ascendancy.

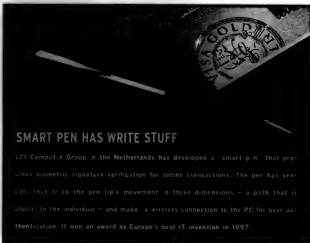
It's tempting to think that Microsoft's rivals will wipe up. But a look at the next wave of industry battleships — directors, objects, Java, network computers and Internet payment, among others — shows that Microsoft's competitors still show every sign of finding new ways to self-destruct. Apparently, knowing the lessons of the past is one thing; acting upon them is quite another. □

Moschella is an author, independent consultant and weekly columnist for Computerworld. His Internet address is david\_moschella@csc.com.



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## SMART PEN HAS WRITE STUFF

LCI Computer Group in the Netherlands has developed a "smart pen" that provides asymmetric signature verification for online transactions. The pen has sensors that track the pen tip's movement in three dimensions — a path that is unique to the individual — and make a wireless connection to the PC for user authentication. It won an award as Europe's best IT invention in 1997.

## Computerworld INDEX

Companies asked to produce internal E-mail as legal evidence: **60%**  
Number of 747 planes it would take to hold Bill Gates' fortune: **269**  
Stock transactions handled Jan. 12 by Nasdaq computers: **408** per second

Internet domains registered in 1996: **489,000**  
Internet domains registered in 1997: **960,000**  
Web server market share of the noncommercial Apache Web Server: **50%**

Sources: Security for Hange Resource Management, Alexandria, Va.; Intel Server Journal, New York; the New York Times; The Apache Group, Oakland, Calif.

## Pay-per-review

A pay-per-use internet application could make it easier to write employee performance reviews. The Web site ([www.PerformanceReview.com](http://www.PerformanceReview.com)) walks managers through the employee rating process. A single use costs \$9.95.

## Big things come in small pack

Kopin Corp. in Taunton, Mass., has developed what may be the world's smallest high-resolution color monitor, with a diagonal screen measurement of 0.24 in. The CyberDisplay 320C can be embedded in a wide variety of portable devices, including cellular Web phones, smart pagers and digital cameras. The resolution is 320 by 240 pixels and uses active-matrix LCD technology.



The CyberDisplay 320C display presents an image "equivalent to viewing a 20-in. monitor from a distance of 5 feet," the vendor claims.



## InsideLines

### Rage from Magazine

"Considering who's going on at the White House, I thought it might be safer to be in New England than there," quipped White House adviser Ira Magaziner in a speech on electronic commerce to the Massachusetts Software Council Friday. Magaziner added, "Actually, it might be safer to be in the free-free zone in Seattle than at the White House."

### Another year older and deeper in debt

Talk about the birthday blues. It was bad enough that Sylvania CEO Mitchell Karmann had to drop a bomb about raging Japanese sales managers leading revenues before its blink. What made the whole thing really galling was that Karmann had to face up on his 49th birthday. "They blew out the candles all the way from Japan," he said in a bit of black humor during a teleconference. Further evidence Karmann can still smile through the pain: After talking about Sylvania's results for 15-plus minutes, he suggested that the line be opened for questions "before I actually start frowning at the mouth."

### Beta blueprint

Microsoft will lay out the blueprint for the Beta 5 release of NetWare 5, code-named Blank, at its NetWareWorld for Small Business conference Tuesday. The NetWare 5 beta, due in early spring, will feature long-wished native TCP/IP support, plus expanded support for Java and CORBA.

### WIN WIN buy AT?

Stack in Britain. Telecommunications hit a 30-month high last week on rumors that Microsoft planned to buy the telco. BT officials scoffed at the notion. "I've just waiting for Wapleworth's to put in a bid," a spokesman joked.

### Intel plays all the angles

Dashdot vendors should be scrambling next week to make announcements based on Intel's latest Pentium III chip, which has a 333-MHz clock speed. Intel is making its own push for the Pentium III chip, which debuted last fall at about \$5,000 per system. The company reportedly is giving subsidies to vendors that optimize their Web site for the new chips. Translation: Run slower without the latest and greatest of chips.

### Messaging wars get ugly

The competition between messaging rivals Lotus and Microsoft has heated up. It started in November when Microsoft rolled out Exchange 5.5 and Lotus blasted an E-mail to the press outlining its questions to self Microsoft about Exchange 5.5. The E-mail pointed out what Lotus deemed as weaknesses in Exchange, such as the lack of an enterprise directory. Microsoft answered those questions on its Web site, pointing out shortcomings in Lotus. With Lotusphere this week, the latest jab comes from the Microsoft camp in the form of an E-mail blast, "What does Lotus fear?"

### Papercut recruiting

Here's a new way to seek programmers, engineers and other IT experts — post your problems in the advertisements that run before science-fiction films. Officials at Microsoft Development, in Wayland, Mass., got the idea when they attended the opening of Starship Troopers with their programmers and noticed that the audience was half teen-agers and half techies.

The Microsoft spin controllers are in high gear. In case we didn't fully understand the company's position relative to its disagreement with the Department of Justice, Microsoft thoughtfully sent over a "white paper" outlining "context" for the strong competition Microsoft is facing. That must be why Netscape is leaving off people, Corel is drowning in red ink and Apple can't find a permanent CEO. If you have any white papers or news tips, send them to news editor Patricia Keefe at (508) 820-8183 or E-mail her at [patricia\\_keefe@msn.com](mailto:patricia_keefe@msn.com).



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